MAKING SENSE OF DIVERGENT CAREER TEST SCORES

A Dissertation

by

STEVEN RODRIGUEZ, JR.

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 2008

Major Subject: Curriculum & Instruction

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ABSTRACT

Making Sense of Divergent Career Test Scores. (May 2008)

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The purposes of this study were to discover patterns in test scores when both the Myers-Briggs Type Indicator and the Strong Interest Inventory are used simultaneously and to offer career counselors practical ways to interpret the scores when counseling their clients. To do this, the researcher conducted one study using canonical correlation to study the relationships and interrelationships between scores on the MBTI dichotomies and the SII GOTs. A second study utilized MANOVA to increase our understanding of age and gender differences in scores on these two instruments. Another study sought to use case examples of clients who had completed both tests to explain practical ways that career counselors can help their clients understand and apply results of both tests in ways that most benefit the clients' career decision making.

From the results of these studies, it would appear that the most common scores to occur simultaneously on both tests at once are MBTI Intuition, and SII Artistic. One could conclude from this that the personality characteristic of enjoying working in settings that allow for creative endeavor is particularly strong relative to other personality characteristics measured by these tests. We could also conclude that as individuals age, they are more likely to prefer working in settings that allow them to pursue creative endeavors. Another conclusion supported by this data indicates that men

are more comfortable with career fields that are unstable and entrepreneurial than women throughout the lifespan.

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CHAPTER I

INTRODUCTION

Overview

Many individuals seek knowledge about how their individual strengths and weaknesses relate to particular careers by using career tests (Kidd, 2003, Walsh and Osipow, 2005). These individuals often use results of these tests in their efforts to make the most informed possible initial career choice, or change in career after having developed much workplace experience. Individuals often also report that they are unhappy with their current jobs or knowledge about themselves relative to potential careers.

Because such important life changing decisions are often made based on the results of career tests, this research seeks to help those who administer these tests by expanding their understanding of career test results. Specifically, as we explain in further detail, this study seeks to describe relationships between client scores on two of the most commonly used career tests. This will assist those who administer these tests by helping them better understand them. When explaining results of these tests to clients, therefore, administrators of these career tests will better be able to help the client make sense of the results and ultimately make applications of the results to their client's career decision making. This brief work will serve as an introduction to a larger work that will describe a study of relationships between these tests.

This dissertation follows the style and format of the *Journal of Vocational Behavior*.

Thus, herein we will briefly describe the context of the problem to be addressed and the research literature about the tests under investigation.

Two of the most commonly utilized career tests are the *Myers-Briggs Type Indicator* (MBTI®) (Myers, McCaulley, Quenk & Hammer, 1998) and the *Strong Interest Inventory* (SII™) (Harmon, *et al*., 1994). Although a significant body of research and other literature has been written to describe how a career test administrator can help their client apply results of either of these individual tests to their lives, little has been written about how an administrator can help their client understand test results when both tests are used simultaneously. As will be explained, although these two tests are often considered to be the most commonly used career tests, and they are often used together (Hammer & Kummerow, 2001), the few studies that have sought to illuminate relationships between scores of these two tests involve older versions of these tests that are no longer in use, and the results of these studies are limited in their generalizability because their participants lacked diversity regarding ethnicity, gender, and age (Dillon & Weissman, 1987; Apostal, 1991; Myers *et al*., 1998; Hammer & Kummerow, 2001). Because people make such important decisions based on what they learn from these tests, it follows that much needs to be known about the meaning of these results and how they relate to the lives of the people who utilize them.

Significance

As will be explained in the following example, relationships between scores on these two tests can have a profound effect on the career test administrator's interpretation of career test results, the clients understanding of the results, and ultimately the career decision making of the client. Among the most commonly

misunderstood relationships between scores on the two tests is the following. Let us say that a client generates a high score on Intuition, which when measured on the MBTI represents a preference for perceiving new information from an abstract, future-oriented, big picture sort of perspective (Myers *et al*., 1998). Commonly, a client who scores high on MBTI Intuition will often also scores high on Artistic scale on the SII, which represents an interest in creative novel ways of perceiving the world (Dillon & Weissman, 1987; Apostal, 1991; Myers *et al*., 1998; Hammer & Kummerow, 2001).

Despite this revealing pattern, many questions remain with respect to relationships between scores on these two tests. A counselor might want to know, for example, if this pattern can be found when examining the scores of students of many different characteristics; for example, various nationalities, ethnicities, or stages in career. Also, what does a pattern such as the one mentioned above reveal? How can someone who is administering these tests, make sense of these results to their clients? Furthermore, if a similar pattern does repeatedly occur, is it necessary to offer both tests to a client or is either one of the tests sufficient?

These questions are further confounded when the results do not seem so clearly easy to explain. Let us say that the client who above scored high on MBTI Intuition and rather than scoring high on SII Artistic, which again would seem simple to understand and explain, scores high on SII Realistic, which often indicates an interest in building or repairing. These results may not be as easy to explain as the previous scenario.

Clearly it is important for users of the MBTI and SII to understand relationships between these two career tests since both of them are often jointly utilized and clients often make such important decisions based on the results of them. It is also important

that the results of research that explains relationships between these tests be applicable to ethnically, age, and gender diverse populations so that counselors can be as informed as possible when working with these clients. After briefly describing the MBTI and SII, this paper will briefly describe relevant research about the two instruments, as well as career development relative to age and gender as an introduction to the description of a research study which seeks to broaden our knowledge in this area.

Instruments

Myers Briggs Type Indicator *(MBTI)*

The *Myers-Briggs Type Indicator* (MBTI®) (Myers, McCaulley, Quenk & Hammer, 1998) was originally the brainchild of Katharine Myers (Saunders, 1991). Myers based the test on the theory of the Swiss psychiatrist Carl Jung. Jung posited that based on similarities of personality preferences and behaviors, all individuals can be categorized into one of sixteen different psychological types (Jung, 1923). The purpose then of the MBTI is to help one discover which of the 16 types most closely resembles themselves in their efforts to understand their own strengths and weaknesses relative to those of others.

Since Myers' initial development of the test in the mid 20th century, hundreds of research studies have been published to validate the MBTI, which is now published in 16 languages, and much has been written about applications of psychological type to educational settings (Murphy, 1992), therapeutic interventions (Provost, 1993), career development (e.g., Kummerow, 2000), and leadership development (e.g., Kummerow, Berger, & Kirby, 1997; Kroeger, Theusen, & Rutledge, 1992).

Strong Interest Inventory

The *Strong Interest Inventory* (SII™) (Harmon, *et al*., 1994) is an interest assessment that has been used widely for career development activities and career counseling for years (Levin, 1990; Pinkney, 1983). Where the MBTI is widely used in many different kinds of settings to help individuals understand their individual strengths and weaknesses, the SII has been developed since around the middle of the twentieth century as strictly an assessment of career-related interests. The test is based on the theory of six, career-related personality types of John Holland (1997). The six personality types of his theory include Realistic (R), which indicates an interest in building or repairing, Investigative (I), which indicates an interest in researching or analyzing, Artistic (A), which indicates an interest in creating or enjoying art, Social (S), which indicates an interest in helping or instructing people, Enterprising (E), which indicates an interest in selling or managing, and Conventional (C), which indicates an interest in accounting, or processing data.

Holland asserts that our personality type is defined by a hierarchy of preferences for each of these six interests. Each individual has a preferred interest and a set of five other interests which are successively less of interest than the first. For example, one might have a personality hierarchy of AISCER, where A is of highest interest and R is of lowest. According to Holland, an individual is constantly striving to align their career activities with their RIASEC hierarchy of interests. As he states, we constantly strive to relate our hierarchy of interests to a model career environment. Like the MBTI, the SII has been extensively researched and validated by hundreds of studies since its initial development in the mid 20th century (Harmon, *et al*., 1994).

Relevant Literature

Lifespan Perspectives on Career Development

Life-span development theories have a long tradition in psychology of helping individuals broaden their understanding of the ways in which people change as they age (Salkind, 2004). Among the more prominent of these are those of Lawrence Kohlberg (Kohlberg, 1968) and Erik Erikson (Erikson, 1963) whose theories imply that individuals increasingly expand their ability to problem solve and understand their world in ever more sophisticated ways (Salkind, 2004). As will be further explained, the theory of Donald Super (1994) has been chosen to as the framework to be used to understand differences in relationships between career test scores. This is because his is the only theory among many others that relates to careers, has been extensively researched and accounts for every aspect of the human lifespan (Walsh & Osipow, 2005; Brown & Associates, 2002; Osipow & Fitzgerald, 1996).

There is a significant lack of published material that offers insight into career development issues of children (Watson & McMahon, 2005). Likewise, mid-career development has been neglected both in the career development research literature and in practice in the world of work because the vocational psychology literature has primarily focused on initial career choice, which is often associated with late adolescent and traditional college age adults (Swanson, 2003; Powers & Rothausen, 2003).

Despite the lack of published knowledge about child and mid-career development, a comparatively larger amount of literature about adolescent and young adult career development informs us that adolescents' maintain fairly stable career interests throughout their high school years (Tracey & Robbins, 2005), and that their

career choices are highly influenced by their parents (Jacobs, Chhin & Bleeker, 2006). Also, literature about workers who are more advanced in their career development suggests that older workers are most concerned with physical health issues and adaptability of their skills to the world of work as opposed to other career-related issues like, for example, developing and maintaining positive relationships in the workplace (Robson, Hansson, Abalos, and Booth, 2006).

Although there is arguably ample published research about the career development of adolescent, young adults and to a lesser degree older adults, this data is irrelevant to a career counselor who is trying to help their client with their mid-career decisions. Despite the relevant information that the published career information about adolescents and young adults can provide to a career counselor who is working with someone within that age range, a career counselors' perspective could certainly be broadened and informed by more information about career development throughout other parts of the lifespan. The proposed research described here after is a step toward an expansion of career development literature that can inform career development professionals working with clients of any age.

Gender Differences in Career Development

Despite a fair amount of literature about gender differences in career development, a theory of women's career development has not emerged. This has been due in large part to the conflicting literature about differences that may or may not be significant in the career development of men and women (Gati, Osipow, & Givon, 1995; O'Brien & Fassinger, 1993; Fitzgerald & Crites, 1980). As will be described in greater detail later in this work, the literature suggests that men and women experience gender

specific career-related learning situations (Williams & Subich, 2006; Betz, Harmon, & Borgen, 1996), that they have more positive outcome expectations for traditionally gender specific careers (Lent, Brown, & Hackett, 1994), and that they develop greater self-efficacy in traditionally gender specific careers (Betz & Hackett, 1981).

These findings imply significant differences in the ways that women and men perceive themselves relative to careers based on their career-related learning experiences and potentially other factors. These findings suggest that men and women may also differentially develop different interests throughout the lifespan. This proposed study seeks to illuminate our understanding of these potential differences in an effort to assist administrators of career tests in helping their clients make sense of career test results.

Purpose

As has been explained, this study will describe relationships between client scores on two of the most commonly career tests. This is because these differences can have a profound impact on a career test administrator's understanding of career test results, and their client's career decision making. Despite results of the published studies in this area (Dillon & Weissman, 1987; Apostal, 1991; Myers *et al*., 1998; Hammer & Kummerow, 2001), little has been explained in this area that can assist career test administrators in their interpretations. Thus, the purpose of the present study is to discover the nature of relationships between the MBTI dichotomies and the SII GOTs.

The following are three papers which seek to advance our knowledge about relationships about career tests. Chapters II and III are studies that seek to illuminate our understanding of relationships between the MBTI and the SII. The second will also go

beyond the scope of previous research in this area by examining potential differences in relationships by age and gender. Chapter IV will make a justification for further literature that may help professionals who utilize career tests in assisting their clients in making sense of the results of these tests in their lives.

CHAPTER II

LITERATURE REVIEW

Introduction

Everyday people make career decisions based on the results of career tests. Based on what they learn, people may continue upon a career path to which they have already committed or, as is often the point of using these tests in the first place, they decide to embark on an entirely new career; perhaps even one that they have never before considered. Two of the most commonly utilized career tests are the *Myers-Briggs Type Indicator* (MBTI®) (Myers, McCaulley, Quenk & Hammer, 1998) and the *Strong Interest Inventory* (SII™) (Harmon, *et al*., 1994). Much is written about the individual use of these and other career tests and how professionals using these tests can help their clients make meaning of the results of them in their lives (Walsh & Osipow, 2005); however, career counselors often use multiple career tests at once and little published literature addresses application of these tests when jointly administered.

The purpose of this study is to examine relationships between components of the MBTI and SII in an effort to enhance the understanding of career test administrators in their efforts to assist their clients. This increased understanding will allow test administrators to offer their clients a deeper understanding of the results of these tests when used together, as is commonly the case. The following is an explanation of research that has examined relationships between scores on these two tests, as well as literature about gender and age differences in career development. This explanation is necessary as the case is being made that an examination of these test scores using

currently utilized versions of these tests, in consideration of gender and age variations is necessary to optimally assist test administrators in guiding both male and female clients of various age in their career decision making efforts.

Hammer and Kummerow (2001) explain that clients gain a more in-depth picture of themselves when they have the SII and the MBTI conjointly administered and results explained to them than they do when they have either of the tests individually administered and results explained to them. Over a two to three year period, this researcher informally polled university career counselors at national and regional conferences of career counselors throughout the United States. Consistently, he found that they often remarked that more than any other combination of career test administration, they jointly administered both the Myers-Briggs Type Indicator (MBTI) and the Strong Interest Inventory (SII) to their clients and that they felt that the combination of both of these test results offered their clients the most broad, in-depth understanding of themselves relative to understanding what types of careers and specific jobs might work well for them based on their individual strengths and weaknesses. Because people make such important decisions based on what they learn from these tests, it follows that much needs to be known about the meaning of these results and how they relate to the lives of the people who utilize them.

Significance

Despite the popular joint use of these two psychological instruments by university career counselors, few studies have examined relationships between various components of these tests (Dillon & Weissman, 1987; Apostal, 1991; Myers *et al*., 1998; Hammer & Kummerow, 2001). This may be because often scores on one test seem to

clearly affirm the scores of the other. For example, intuition, which is measured in the MBTI, represents a preference for perceiving new information from an abstract, future-oriented, big picture sort of perspective. Similarly, one aspect of the SII is the Artistic scale which represents an interest in creative novel ways of perceiving the world. As one might expect, a student whose MBTI test results reveal a high score on Intuition often also scores high on Artistic as measured by the SII (Dillon & Weissman, 1987; Apostal, 1991; Myers *et al*., 1998; Hammer & Kummerow, 2001).

Despite this revealing pattern, many questions remain with respect to relationships between scores on these two tests. A test administrator might want to know, for example, if this pattern can be found when examining the scores of students of many different characteristics; for example, gender, or stages in career. Also, what does a pattern such as the one mentioned above reveal? How can someone who is administering these tests, make sense of these results to their clients? Furthermore, if a similar pattern does repeatedly occur, is it necessary to offer both tests to a client or is either one of the tests sufficient?

Clearly it is important for users of the MBTI and SII to understand relationships between these two career tests since both of them are often jointly utilized and clients often make such important decisions based on the results of them. It is also important that the results of research that explains relationships between these tests be applicable to age, and gender diverse populations so that test administrators can be as informed as possible when working with these clients. After briefly describing the MBTI and SII, this paper will briefly describe relevant research about the two instruments, as well as

career development relative to age and gender as an introduction to the description of a research study which seeks to broaden our knowledge in this area.

Instruments

Myers Briggs Type Indicator *(MBTI)*

In the early part of the twentieth century, the original author of the *Myers-Briggs Type Indicator* (MBTI®) (Myers, McCaulley, Quenk & Hammer, 1998), Katharine Myers sought to create a psychological instrument the results of which would help people understand their individual preferences through an understanding of the theory of psychological types (Saunders, 1991). The swiss psychiatrist Carl Jung developed this theory from introspection of his private practice clients in the early 20th century and first described it in his 1923 published text, *Psychological Types*. Although her primary purpose was to help women decide what types of jobs they might wish to pursue around the time of World War II when most of the male-dominated workforce in the United States was in military service, the MBTI has since been widely used throughout the world in the fields of education, counseling, and employee development.

Jung described human personality as being comprised of four dichotomies: Extroversion-Introversion (EI), Sensing-Intuition (SN), Thinking-Feeling (TF), and Judging-Perceiving (JP) (Jung, 1923). The EI scale deals with whether people prefer to focus their attention on the external world of people and things (E), or the inner world of ideas and impressions (I). The SN scale addresses whether people prefer to deal with present and concrete information gained from their senses (S), or on patterns and possibilities (N). The TF scale encompasses whether people prefer to make decisions based on logic and objective analyses (T), or values and people-centered concerns (F).

The JP scale measures how people deal with the outer world. Those with a preference for judging (J) prefer a planned, organized approach to life, and those with a perceiving preference (P) tend to prefer a flexible and spontaneous approach to life.

Applications of these preferences to the world of work have been extensively published (Kummerow, 2000: Tieger & Barron-Tieger, 2001; Kroeger, Theusen, Rutledge, 2000; Kummerow, Berger, Kirby, 1997).

Strong Interest Inventory (*SII*)

The *Strong Interest Inventory* (SII™) (Harmon, *et al*., 1994) is an interest assessment that has been used widely for career development activities and career counseling for years (Levin, 1990; Pinkney, 1983). John Holland (1997), whose theory the SII is based upon, advanced six career-related personality types (RIASEC) including Realistic (R), which indicates an interest in building or repairing, Investigative (I), which indicates an interest in researching or analyzing, Artistic (A), which indicates an interest in creating or enjoying art, Social (S), which indicates an interest in helping or instructing people, Enterprising (E), which indicates an interest in selling or managing, and Conventional (C), which indicates an interest in accounting, or processing data.

What defines our personality, in his view, is the fact that we resemble the characteristics of each of the RIASEC types in a hierarchy. For example, every person has a highest score on one of the RIASEC types and a lowest score the order of which represents their personality profile. Holland states that one's experiences with the environment including various life situations, and interpersonal interactions as well as biological heredity help one to develop which of the six RIASEC types most represent themselves. Like the six personality types, Holland states that there are also six model

environments relative to career, which are also defined as RIASEC. The environments include activities that relate to the personality characteristics of the people involved in that environment, which are the same as the RIASEC personality descriptions.

Thus, a universal life goal is to progress in such a way as to strive to find and sustain work in a career environment that aligns personality preferences with a model environment. For example, if one who exhibits characteristics that are indicative of the Social personality type would strive toward securing a job that allows them to engage in activities relative to the Social model environment like actively development social networks or attending to the needs of others, they would be likely to achieve career satisfaction.

Career Development Across the Lifespan

Ages Variations in Personality.

It may seem obvious that a counselor needs to consider the age of their client in career counseling for several reasons. First, it seems obvious that people change as they grow older, and consequently, a counselor's approach to counseling someone could vary based on the age of their client. Also, a counselor's interpretation of career test data could vary based on the age of their client. In an effort to inform professionals who assist clients with their career decision making, we will explain our rationale for examining age variations in client scores on the MBTI and SII. We will also discuss the literature about human development throughout the lifespan as well as literature that describes how we understand careers and experience career development throughout our lives. With these lifespan career development differences in mind, we will build the

case for examining relationships between scores on the MBTI and SII from the perspective of one particular lifespan, career development theory.

Although it may seem obvious that an individual may require unique interventions from those who assist them in their career decision making based on their age, research about whether significant psychological changes occur all throughout our lives is inconsistent (Costa, McCrae, 2006; Roberts, Walton, Viechtbauer, 2006a; Roberts, Walton, Viechtbauer, 2006b). Roberts, Walton, Viechtbauer (2006a), for example, synthesized seventy two longitudinal studies which sought to discover changes in human personality as one ages. In sum, these studies revealed that people increasingly become socially dominant, conscientious, and emotionally stable as young adults. Where some assert that much of this psychological development occurs in young adulthood and largely stabilizes around age 30 (Costa and McCrae, 2006), Roberts, et al (2006a) generated evidence that these developmental changes also occur at least through age 50 when they largely plateau. Roberts, et al (2006a) also noted that individuals demonstrate gains in social vitality and openness to new experiences early in life, but that decreases begin to occur in these same domains in the mid 50's. These results are affirmed by Wertheim, Widom, and Wortzel (1978) who found that older women were more likely to pursue traditionally female-dominated careers.

These findings imply that humans become increasingly socially stable until perhaps their early thirties, and that this development slows dramatically thereafter, but does not necessarily stop. These findings also imply that younger individuals are more open to new ideas and experiences than senior adults. These findings have significant ramifications for those who are trying to help interpret career test data and ultimately

assist individuals in solidifying their career-oriented decisions or make potentially dramatic changes in their careers. Because a younger individual might have an easier time acclimating to new ideas and perspectives about their careers revealed from career test data and counseling than someone who is older, a. counselor might anticipate that this younger client might be much more accepting of career test results that reveal strengths and interests in areas that they had not before considered as opposed to older adults. Subsequently, it might be much more difficult to convince older adults of the possibility of their considering career pursuits that are dramatically different from their preconceived idea about what they might want to pursue or have the ability to pursue.

Where it seems that younger individuals are more open to new perspectives about their careers, it seems this phenomenon would only be exacerbated by seemingly divergent scores on career tests. We have asserted earlier that among the most popular career tests in usage are the MBTI and the SII, administered together, and therefore in combination constitute the most likely career tests to be offered to individuals. Because of this it seems that if, for example, a young individual scores high on MBTI Intuition and SII Realistic or some other seemingly unrelated combination of test scores, they would not have as much challenge understanding or making sense of these findings as an older person with the same scores. If an older individual, however, received some similar set of scores, the fact that they are already not very opened to new perspectives about their careers might make this individuals' counseling process much more difficult than the younger person and ultimately the transition to a career-oriented change for this older individual might be more treacherous than that of the younger individual.

This example highlights why investigations of scores between these two very commonly used career tests need to be conducted examining potential differences in scores across the lifespan. Although some research has examined relationships between scores on these two tests, as mentioned above, the example described above clearly illuminates the need to consider these relationships from a lifespan developmental perspective, which is lacking in previous research. As we have seen so far, the basic research about personality development throughout the lifespan offers a rationale for examining differences in career test scores. The literature on career development offers this problem a history of examining career development from a lifespan perspective, which can help us alleviate the challenges of striving to assist individuals in their unique life stage.

Career Development Literature

Trait-Factor Theory. The career development literature began with Frank Parsons (1909), who described career development as a process involving deliberate decision making and choices rather than allowing career development to occur by chance. His theory, often described as a trait-and-factor theory, advocates individuals' thoroughly examining themselves and the needs of specific jobs, then striving to as much as possible match themselves with jobs that they feel are appropriate for them. He further explains that not only will employee efficiency and satisfaction be enhanced as a result of this process, but employer hiring costs will also decrease. As Parson's theory advances the idea of examining individual strengths and aligning these strengths to specific job characteristics, it has been the impetus for the career testing movement as

manifested in the development and use of the MBTI, the SII, and the myriad other career tests in use.

Lifespan Theories. In contrast to Parson's approach to considering personality or character traits and aligning them with the needs of particular jobs, Ginzburg, Ginsburg, Alexrad, and Herma (1951) first described career development as a process that should be conceived of as an ever changing lifelong developmental process. Many well-documented cognitive lifespan development theories (Salkind, 2004; Miller 2001; Shaffer & Kipp, 2006; Lacy & Hendricks, 1980) advocate this approach to human understanding. Among the more prominent are the developmental stage theories of Lawrence Kohlberg (Kohlberg, 1968) and Erik Erikson (Erikson, 1963) that imply an increasing human ability to perceive the world and problem solve in ever more sophisticated ways (Salkind, 2004; Miller 2001; Shaffer & Kipp, 2006).

Perhaps the two most prominent career developmental theories are those of Linda Gottfredson (1981, 1996, 2002) and Donald Super (1957). Gottfredson's (1981, 1996, 2002) theory of career circumscription describes a theory of career development relative to children and adolescents. The four stages in her theory include children understanding the concept of an adult (ages 3-5), developing their own individual gender identity (6-8), orientation to that which is socially valuable, abstract and conceptual (9-13), and understanding and development of their own unique self.

Super's Theory of Vocational Choice. While Gottfredson's theory helps to illuminate our understanding of how children and adolescents develop relative to careers, within the vocational psychology literature, the developmental theory of Donald Super (1957) seems to be perhaps the most widely respected theory of career

development (Kidd, 2003; Walsh & Osipow, 2005; Brown & Associates, 2002; Osipow & Fitzgerald, 1996) perhaps because it offers insight about career development throughout the whole of the lifespan. Where previous career development literature focused on helping the mental health professional prescribe possible solutions to clients about their career decisions, and Parson's (1909) work advocated matching individuals' strengths to job requirements, Super's work was among the first to advocate individual understanding of self relative to the world of work on the part of the client as well as decision making that was instigated more by the client than by the mental health professional (Ginzberg, Ginsburg, Alexrad & Herma, 1951).

While Parson's approach is simple and practical, the lifespan approach to understanding how individuals' relate to the world of work may be a more wholistic way to approach job selection because it helps one consider their strengths and weaknesses chronologically rather than simply at any given place in time. Because of the approach that Super's theory offers allowing us to understand the career development of individuals throughout the lifespan, in contrast to Gottfredson's theory which focuses on children, we have chosen to examine our age-related questions of relationships between career test scores on the MBTI and SII through the framework of Super's theory.

Super's career development theory involves 5 stages including: growth (young adolescence, ages 4-13), exploration (adolescence, ages 14-24), establishment (early adulthood, ages 25-44), maintenance (middle adulthood, ages 45-65), and disengagement/decline (late adulthood, ages 65 and older) (Super, 1957). Super's theory was later expanded describing three activities that coincide with each developmental stage: exploration (crystallization, specification, implementation), establishment

(stabilizing, consolidating, advancing), maintenance (holding, updating, innovating), disengagement (deceleration, retirement planning, retirement living) (Super, Thompson, Lindeman, Myers & Jordan, 1988).

Super (1980) also described a life-span, life-space model in which a rainbow illuminates life roles such as child, student, spouse, parent, employee, club member and other roles. Super argued that a career clients' examination of the development and possible extinction of their many life roles expands their understanding of how career interests can be manifested throughout life roles; not simply through career-related activities.

Because Super's work is the only well-researched career development theory that accounts for every aspect of the lifespan, it seems logical to utilize his age-related framework in considering differences in client career test scores. Herein we describe the literature that describes the career development experiences of individuals of different ages as further justification for utilizing Super's theory as our framework for understanding distinctions between test scores on the MBTI and the SII throughout the lifespan.

Support for Super. Despite Roe's (1956, 1957, & 1984) and Roe & Lunneborg's (1990) initial description of career development as a learning process and that career development is highly influenced by childhood, environmental experiences, it has been suggested that there is a significant lack of published material that offers insight into career development issues of children, the age corresponding to Super's GROWTH (4-13) stage (Watson & McMahon, 2005; Hartung, Porfeli, & Vondracek, 2005).

In contrast to the human development theories such as those of Kohlberg, and Erikson which emphasize distinct changes in mental processing throughout childhood, the vocational psychology literature has emphasized age milestones in the career development of adolescents (Blustein, 1997; Savickas, 1997) and adults (Lea & Leibowitz, 1992; Vondracek & Kawasaki, 1995) and children to a much lesser degree. The limited, extant child career development literature focuses on illuminating what children understand about careers rather than broadening our understanding of developmental changes in children relative to their understanding of and self efficacy about careers (Watson & McMahon, 1995; Hartung, Porfeli, & Vondracek, 2005).

Many studies affirm the first aspect of Super's theory. This first stage, which Super called Growth, describes a crystallization, alignment and implementation process in the career development of children from age 4 to 13. Hartung, Porfeli, and Vondracek (2005), for example, found that as children grow older, they gradually begin understanding characteristics of an increasing number of professions. As this understanding increases, children also begin comparing their strengths and weaknesses to advertised job postings both in the 3rd and 4th grade, (Nelson, 1978; Trice, Hughes, Odom, Woods & McClellan, 1995) and 5th and 7th grade (Goldstein & Oldham, 1979). This comparing of strengths and weaknesses sounds very much like the alignment process that Super describes. With this increased conception of jobs comes an increased tendency to engage in part-time jobs from the middle to high school years (Entwisle, Alexander, Olson, & Ross, 1999; Csikszentmihalyi & Schneider, 2000), which sounds remarkably like the implementation process and Exploration (ages 14-24) stage that Super describes. As this career exploration and experimentation begins occurring, it has

been suggested that adolescents' maintain fairly stable career interests throughout their high school years (Tracey & Robbins, 2005), and that their career choices are highly influenced by their parents (Jacobs, Chhin & Bleeker, 2006).

Mid-career development, associated with Super's third stage which he called Establishment (ages 25-44), has been neglected both in the career development research literature and in practice in the world of work because the vocational psychology literature has primarily focused on initial career choice, which is often associated with late adolescent and traditional college age adults (Swanson, 2003; Powers & Rothausen, 2003). Super (1984) and Miller and Winston (1990); however, argued that nontraditional age college students, which are typically defined as being over the age of 25, have substantially different needs for career assistance than their traditional age college student (under age 25) counterparts. It has also been suggested that these older college students are much more career focused in their educational pursuits than younger students (Ashkar & Skenes, 1993; Brock & Davis, 1987; Mounty 1991). These findings are consistent with the career development work of Super (1957; 1980) and Gottfredson (1981; 1996) who postulate that individuals develop increased career focus as they age.

Literature about workers who are more advanced in their career development, associated both with Super's fourth stage called Maintenance (ages 45-65), and fifth stage called Disengagement/Decline (ages 65 and older), suggests that older workers are most concerned with physical health issues and adaptability of their skills to the world of work as opposed to other career-related issues like, for example, developing and maintaining positive relationships in the workplace (Robson, Hansson, Abalos, and Booth, 2006).

Although there is arguably ample published research about the career development of adolescent, young adults and to a lesser degree older adults, this data is irrelevant to a career counselor who is trying to help their client with their mid-life career decisions. Despite the relevant information that the published career information about adolescents and young adults can provide to a career counselor who is working with someone within that age range, a career counselors' perspective could certainly be broadened and informed by more information about career development throughout other parts of the lifespan. The proposed research described here after is a step toward an expansion of career development literature that can inform career development professionals working with clients of any age.

Gender Differences in Career Development

Originally women's career development issues were not considered to be about the specific issues that women face in their career development, as opposed to men, but whether or not women chose a career at all. Astin (1980) advanced a theoretical model that suggests that men and women differ in their career expectations and hence career choices and behaviors and was among the first to note the importance of gender differences in career development. Although career development has been written about since the early 1900's (e.g. Parsons, 1909), and despite a fair amount of literature about gender differences in career development beginning approximately in the 1970's (Farmer, 2006; Lonborg & Hackett, 2006), a theory of women's career development has not emerged. This has been due in large part to the conflicting literature about differences that may or may not be significant in the career development of men and

women (Gati, Osipow, & Givon, 1995; O'Brien & Fassinger, 1993; Fitzgerald & Crites, 1980; Fitzgerald & Betz, 1983).

As will be described in greater detail later in this work, the literature suggests that men and women experience gender specific career-related learning situations (Williams & Subich, 2006; Betz, Harmon, & Borgen, 1996), have more positive outcome expectations for traditionally gender specific careers (Lent, Brown, & Hackett, 1994), and develop greater self-efficacy in traditionally gender specific careers (Betz & Hackett, 1981). These findings imply significant differences in the ways that women and men perceive themselves relative to careers based on their career-related learning experiences. These findings also suggest that men and women may develop career interests throughout the lifespan differentially. This proposed study seeks to illuminate our understanding of these potential differences in an effort to assist administrators of career tests in helping their clients make sense of career test results.

As we know, men often traditionally assume male gender roles such as providing financially for their families in contrast to women who traditionally assume female gender roles like taking primary responsibility for child-rearing and other household maintenance-oriented tasks. Research about the degree to which men and women assume these seemingly traditional gender roles relative to career; however, illuminate environmental and biological influences on the career decision making of men and women. This research will be explained here as it brings to bear the importance of research that examines gender differences in career test scores on the MBTI and the SII.

Differences in Career Perceptions. As we have noted above, careers perceptions often differ for men and women, but these perceptions seem to change with life

experience. This may be because of differing responsibilities assumed by men and women. For example, it has been asserted that issues of career choice are much more complicated for women than men because women often perceive that higher status career choices bring with them more potential complications regarding family development they might experience (Farmer, 1997; Tipping, 1997; Farmer, 1971; Harmon, 1978). This is in contrast to men who may perceive themselves as experiencing fewer obstacles to their attainment of high prestige professions. Perhaps because men less often make their career choices based on family development issues, Luzzo and Hutcheson (1996) and Luzzo and McWhirter (2001) found that women perceived themselves as having more educational and career barriers than men. Post-Kramer and Smith (1985) found that 8th and 9th grade males and females tended to have similar perceptions of their abilities in male-dominated professions especially law, drafting and engineering.

Another significant difference between men and women is the role that career plays in ones life. Larson, Butler, Wilson, Medora & Allgood (1994) found that men were more likely to delay career choice commitment because they perceive career choice to be a more permanent decision than women, who often perceive career as only one of many significant aspects of their lives. Men may perceive a less than perfect career choice as having a far more devastating effect on the lives of themselves and potential life partners than women.

Despite these differences in perceptions of careers, both sexes seem to perceive barriers to career success in their young adult years. Swanson and Tokar (1991), for example, found that college age students perceived significant career barriers before

them, but perhaps surprisingly found no significant gender differences in the type or degree of these barriers and Luzzo (1995) found that college age women generally exhibit greater career maturity than men specifically related to decision making skills, career attitudes and congruence with particular chosen careers. Clearly reasons for these gender and age discrepancies need to be investigated, and an initial investigation into these factors that influence career decisions will be the first step in such a process. The following description of research about these issues will explicate environmental influences such as family members and other significant social connections, and perceptions of particular careers relative to gender norms.

Environmental Influences. Zytowski (1969) investigated potential factors that influence women's career choices, especially those that might be nontraditional relative to their sex. While, as his research affirmed, definitive conclusions on this subject are illusive, he was among the first to call for further investigation into the environmental factors that influence women's career choices. Harmon (1989) found differences in the career aspirations of two groups of college freshman women. The groups represented college freshman women from the same institution a decade apart. The second group expected to work throughout more of their adult lives than the first group and aspired more to business fields than liberal arts fields in comparison to the first group. This research implies that women perceive themselves as having increasingly diverse career opportunities; certainly more than in the past.

Despite the perception by women of ever expanding career options, social/environmental influences seem to differentially affect males and females in their career choices. Danziger (1983), for example, found that men were more influenced by

their perception of their academic achievement and ability in their career choices, in contrast to women who were more influenced by social origins (e.g. SES, parental influences). Men have also been found to more likely be influenced in their career by teachers or other mentors outside the family than females and the inverse has been found to be true for females (Farmer, 1985). Although Danziger's (1983) report implies that men are less influenced by family members in their career choices, other reports suggest that men have a need for approval and emotional connectedness from parents relative to their career choices (Lucas, 1997).

These conflicting reports about parental influences on male career choice are further complicated by ethnicity and the presence and marital status of parents. Specifically, Flores, Navarro, Smith, and Ploszaj (2006) found that Mexican American men who had high self-efficacy about nontraditional careers, high parental support for nontraditional career choices, as well as fathers who had made non-traditional career choices, more often chose non-traditional careers themselves. This would imply that family experience with nontraditional careers seems to more often influence men to pursue nontraditional careers.

Lemkau (1984) found that men whose parents were divorced, who experienced the death of a parent, reported high career influence from their mothers, or a distant relationship with their father all had a higher tendency to pursue traditionally female-dominated professions than those who did not. These same men reported that many of these career influences, "sensitized them to their nurturant and emotional capabilities" (p. 1).

Based on these conflicting reports, it is clear that there are many influences on the career choices of men and women. As the following will describe, although family or other social influences play a significant role in individual career choice, a growing body of literature describes patterns about the degree to which men and women choose careers that are traditional or nontraditional for their gender. We begin this examination by describing literature about perceptions about the masculinity or femininity of particular career fields.

Career Femininity/Masculinity. In this section we describe literature that deals with male and female perceptions of career fields. Grotevant and Thorbecke (1982), for example, found that high school men and women perceive the concept of career differently. Survey results revealed that both men and women associated vocational identity with masculinity, but that men also associated it with lack of concern for the opinions of others and women also associated vocational identity with hard work. Males also perceived exploration of careers as a feminine rather than masculine trait. Women also perceived competitiveness as negatively related to the development of vocational identity.

Other studies by Harmon (1981; 1972) revealed differences in the numbers of women who were choosing to pursue traditionally male-dominated career fields. She surveyed women six years after they were about to enter college to observe trends in their career choices among other things in relation to her previous study (1972), which examined the same issues. Although many women in both samples pursued very conventional life goals including pursuing traditional female dominated careers such as education or other social services fields, compared to her previous study, the more recent

study found more women choosing traditionally male dominated careers including, doctor, professor and business careers. Contrary to their hypotheses; however, Jome and Tokar (1998) found no significant differences in desire to assume traditionally appropriate male family and spousal roles among either those who scored high on masculinity or femininity.

Jome and Tokar (1998) found that those who held traditionally male-dominated jobs more often endorsed anti-feminine and toughness social norms than men who held traditionally-female dominated jobs. Not only have career masculinity preferences on the part of men and the femininity for women been found, but Gianakos and Subich (1988) found that not only do both men and women tend to make career choices that are traditional for their sex, but women who score a high degree of masculinity (also Chusmir, 1983) or men (also Chusmir, 1990) for femininity on the *Bem Sex Role Inventory* (1981, 1978) tend also to choose careers that are nontraditional for their sex. This research implies that the greater degree of masculinity a man reports or femininity for women, the more likely they are to choose careers that are traditional for their sex.

While these results may seem easily understandable and not so significant to address, the findings of Fitzgerald and Cherpas (1985) imply a bias on the part of mental health professionals in working with those who align with these social norms. The specifically found that counselors were less likely to work with male clients who wanted to work in nursing, a traditionally female dominated profession. Contrary to their hypothesis; however, a higher proportion of the same counselors were willing to work with women who were aspiring to become physicians, a profession which is traditionally male-dominated. It seems from this work that the perceived degree of masculinity or

femininity of an individual's career choices may have a profound affect on the way they are treated by other professionals. While this study does not seek to explain the reasons why individuals make traditionally masculine or feminine career choices, this literature has been described here as further research in this area may be illuminated by results of this study which seeks to describe relationships between career test scores.

Career Choice Traditionality. Some have argued that gender issues in career assessment have often been categorized as psychopathological issues considered to be necessarily treated in much the same way as other psychological deficits, inadequacies or ailments (Bograd, 1984; Brown, 1990; Brown, 1986; Kaplan, 1983). Others have suggested that certain client behaviors that are not considered gender normal in the United States are often psychopathologized by mental health professionals (Root, 1985). Auster and Auster (1981) were among the first to describe a lack of research literature connoting discrepancies in gender representations within certain professions. In their investigation into this issue, they found that an often difficult to describe combination of environmental influences typically lead individuals to make gender non-traditional career choices.

Lonborg and Hackett (2006) affirm that there are no notable sex differences among client scores on the MBTI personality test, but career interest differences have been noted in that women tend to score a preference for Social careers (e.g. teaching, nursing) in contrast to men who tend to score a preference for Realistic careers (e.g. technical fields such as engineering) (Farmer, 2006) on the SII.

Both men and women are more likely to choose careers that they perceive as being traditional for their gender (Harren, Kass, Tinsley & Moreland, 1979), although

among women, high SES adolescents are more likely than those of low SES to choose predominately male dominated professions (Hannah & Kahn, 1989). Hayes (1986) asserted that where much research argues that women need to pursue more male-dominated career fields to achieve gender equality in various professions, men likewise need to pursue more female-dominated career fields toward this same aim. Although balanced gender-representation within professions generally seems to be a noble cause in terms of ensuring gender equality, these gender equity efforts could be limiting if men and women develop perceptions that they should choose particular professions because they are underrepresented by their gender and not solely based on their interest.

Influence of Career Prestige-Level. The issue of prestige-level involves, for example, the degree of financial earning potential and social prestige that a career decision maker associates with a particular career. Leung and Harmon (1990) and Leung and Plake (1990) tested Gottfredson's (1991) model of career circumscription that asserts that people are more likely to choose a career based on a careers sex type, or the individuals perception of which gender traditionally dominates it. The findings of Leung and Harmon (1990) affirm Gottfredson's theory in that men and women similarly reported pursuit of careers based on their prestige level, but that men were less likely than women to pursue prestige careers if they perceived them as being traditionally dominated by the opposite gender.

While these researchers found sex-type to be more important to men than prestige level, Leung and Plake (1990), in contrast, found that prestige level overrided sex type in importance to both men and women. Although Tokar and Jome (1998) found consistencies with Gottfredson's theory similarly to Leung and Harmon (1990),

their findings revealed inconsistencies in pursuit of sex-type careers based on particular career interests.

Purpose

Counselors and clients often ask questions about how the results of one career test relates to the results of the other, and counselors often wonder how they can explain these relationships to their clients. Despite these questions, the few published studies in this area (Dillon & Weissman, 1987; Apostal, 1991; Myers *et al*., 1998; Hammer & Kummerow, 2001) have explained little about relationships between aspects of the SII and the MBTI. The nature of counseling clients relative to results of both the MBTI and the SII can be markedly impacted by a counselor's knowledge of what are and what are not typical scores of clients on both instruments. Thus, the purpose of the present study is to discover the nature of relationships between the MBTI dichotomies and the SII GOTs.

CHAPTER III

RELATIONSHIPS BETWEEN CLIENTS' SCORES ON THE *MYERS-BRIGGS TYPE INDICATOR* AND THE *STRONG INTEREST INVENTORY*

Introduction

Counselors often use more than one career test when striving to assist their clients with career decisions. They do this because one test usually seems to validate the scores of the other test as scores generated from both tests often seem to intuitively match, but what about when this intuitive match does not occur? Naturally counselors want to offer their clients the most in depth amount of accurate information as possible, so counselors often choose to utilize among the most well-researched, well-respected instruments available, like the *Myers-Briggs Type Indicator* (MBTI®) (Myers, McCaulley, Quenk & Hammer, 1998), and the *Strong Interest Inventory* (SII™) (Harmon, Hansen, Borgen, & Hammer, 1994). When the counselor, however, has utilized both of these instruments and the scores seem to be very different from test to test, the counselor is often wondering how to interpret, explain, and help the client make meaning of these results.

Naturally the counseling process is very individual and any counselor a career client works with may interpret test scores differently from any other, but this problem can be particularly perplexing for a counselor who again is trying to offer the most accurate information to their client. Could the differences in the test scores be the result of some sort of serious mental disorder that the client is dealing with, but has not

revealed to the client or could the problem simply involve some test error? Also, are the test score differences common for individuals of that particular gender, age, or ethnicity?

Of course questions like these are ever present in any testing situation, but increased knowledge about how often scores occur between two career tests could be extremely informative to a counselor. Knowledge of the rate of occurrence of these score differences could dramatically impact the information imparted to the client and could therefore dramatically impact the career decisions of the client.

In an effort to assist career counselors in interpreting and explaining career test results to their clients, this study seeks to offer insight into relationships between the two perhaps most popularly used career tests namely the *Myers-Briggs Type Indicator* (MBTI®) (Myers, McCaulley, Quenk & Hammer, 1998), and the *Strong Interest Inventory* (SII™) (Harmon, Hansen, Borgen, & Hammer, 1994). Because very little published literature explains relationships between these two tests (Apostal, 1991; Dillon & Weissman, 1987; Hammer & Kummerow, 2001; Myers *et al*., 1998), as will be further explained, this study seeks to offer insights that can assist counselors in making sense of results from these career tests so that their clients can ultimately as much as possible make informed, meaningful career decisions.

The *Myers-Briggs Type Indicator* (MBTI®) (Myers, McCaulley, Quenk & Hammer, 1998), which is based on Carl Jung's theory of 16 psychological types (Jung, 1923), and the *Strong Interest Inventory* (SII™) (Harmon, Hansen, Borgen, & Hammer, 1994), which is based on John Holland's theory of six occupational interests (Holland, 1977) are two psychological tests that are commonly used by career counselors to assist their clients in their career decision making (Dillon & Weissman, 1987; Watkins,

Campbell, & McGregor, 1988). The popular usage of these tests can likely be attributed to the large amount of available research literature that describes both the validity and reliability of these tests and because, as Hammer and Kummerow (2001) explain, clients gain a more in-depth picture of themselves when they have the SII and the MBTI conjointly administered and results explained to them than they do when they have either of the tests individually administered and results explained to them. The following description of two counselor/client scenarios will further illuminate the need for further examination of relationships between these two tests, which this study seeks to advance.

Differing MBTI / SII Scores

Often a counselor may find it simple to understand and discuss a client's test results when, for example, a client scores high on Intuition on the MBTI, which is related to abstractions and things that are intangible, and high on Artistic on the SII because these aspects of each of these tests instinctively seem to be related. A counselor might have difficulty understanding and explaining results, however, when a client scores high on Intuition on the MBTI and high on Realistic on the SII, which is related to a hands-on, experiential approach to life; the concepts of MBTI Intuition and SII Realistic seem substantively different from one another.

Counselors often expect their clients' test results to be similar to those of the first example described above, but they may just as likely encounter clients who score similarly on seemingly dichotomous scales. How might a counselor distinguish between needs of a single client as dictated by scores on these two tests? In the experience of the researcher, many clients who score high on one of the MBTI dichotomies often seem to score high on the same constructs on other tests (e.g. MBTI Intuition and SII Artistic ,

MBTI Feeling and SII Social), but these patterns do not always occur. Should a counselor advise a client who concomitantly scores high on Intuition on the MBTI and high on Realistic on the SII, which does not occur very often in the experience of the researcher, in such a way that relies more dominantly on one of the tests versus the other? Are Intuition in the MBTI and Realistic in the SII or other components of these two tests related? If there is a relationship, what is its nature?

When counseling clients using the MBTI and the SII, counselors often question which of the results of the two scenarios described above is typical. If a counselor knows, for example, that a high percentage of clients who score high on MBTI Intuition also score high on SII Artistic as in the first example described above, then a counselor may counsel the client described in this first scenario by simply pointing out the similarities of MBTI Intuition and the SII Artistic scale.

A counselor might direct the client in scenario two; however, in such a way as to discover why s/he scored high on MBTI Intuition and SII Realistic. A counselor might discover that this client's family places a high value on having a realistic, hands-on approach to life, even though the client does not have a realistic interest, but rather naturally prefers intangible, artistic activities. The counselor might also find that the client has a high artistic preference, which is often manifested by hands-on activities such as sculpture or in the performance of musical instruments.

Purpose

As has been explained in the discussion of the two scenarios above, the nature of counseling clients relative to results of both the MBTI and the SII can be markedly impacted by a counselor's knowledge of what are and what are not typical scores of

clients on both instruments. Thus, the purpose of the present study is to discover the nature of relationships between the MBTI dichotomies and the SII GOTs. As will be explained in greater detail below, the few studies that have had similar purposes have discovered little about these relationships partly because of limited generalizability due to weaknesses in sampling, utilized statistical techniques, and since revised test versions. After describing literature examining the relationships among components of these two instruments, a study that sought to broaden our knowledge in this area will be described.

Review of Research

This portion of the paper will deal with literature involving both the MBTI and SII including studies that describe the correlation between scales of the two instruments, and literature that describes applications of the concurrent application of the MBTI and SII in career counseling settings. As will be described, aspects of these previous studies that limit the utility of their results lies in the fact that many of these studies used older versions of the MBTI and the SII than are currently in use. Also, generalizability of these results is constricted due to the limited research participant age ranges, as well as limited insight provided by the statistical techniques utilized.

Dillon and Weissman (1987) examined correlations among the eight personality preference dichotomies of the MBTI and the GOT and OS sections of the SII. They examined results from 394 community college students who had requested use of vocational assessments, and had used both instruments with a counselor at the school in which they were enrolled during one academic year. The students were mostly evenly split between men and women and ranged in age from 18 to 36.

The results indicated that more than 50% of the participants who preferred Extroversion as measured by the MBTI, also preferred the Social and Enterprising scales of the SII. In addition, more than 80% of the participants who preferred Sensing as measured by the MBTI indicated a preference for Conventionality as measured by the SII. Significantly fewer men than women who preferred Intuitiveness as measured by the MBTI indicated a preference for the Investigative scale as measured by the SII. More men than women who preferred Introversion as measured by the MBTI indicated a preference for the Artistic scale as measured by the SII. Some statistically significant relationships found among the poles of the MBTI and the OSs of the SII by Dillon and Weissman (1987) include Intuition on the MBTI and Vocational Agriculture Teacher, Beautician, and Dental Assistant on the SII and Sensing on the MBTI and Reporter on the SII.

While this work of Dillon and Weissman (1987) yielded some notably significant findings that are different from findings of more recent studies, it involved versions of both the MBTI and the SII that have since been revised more than once. This fact alone restricts the relevance of their findings now. Applications of these findings are further weakened by the limited age range (18-36) of the research participants, as well as the utilization of the Pearson Product Moment Correlational Technique, which does not provide multiple predictor intercorrelation data.

Apostal (1991) studied correlations between Jungian Sensing and Intuition as measured by the MBTI and the SII GOTs. Apostal studied 219 undergraduate students who were enrolled in a career development course at a midwestern university during one

of three consecutive academic years. The research participants were 2/3 female and their median age was 22.

Like Dillon and Weissman (1987), Apostal found that clients who indicated an Intuitive personality preference on the MBTI, were more likely to score high on Artistic and Investigative interests on the SII than were students with Jungian Sensing personality preferences. However, Apostal (1991) found no significant relationship between Realistic and Sensing, Enterprising and Sensing, Social and Intuition, and Conventional and Sensing.

Also, like Dillon and Weissman (1987), Apostal's study involved versions of these tests that have since been revised more than once, a limited age range of college student research participants and utilization of the Pearson Product Moment Correlational Technique. Furthermore, Apostal's study informs us only about correlations between one dichotomy of the MBTI and the SII GOTs.

Hammer and Kummerow (2001) and Myers *et al.* (1998) examined four sections of the SII relative to the eight personality preference dichotomies of the MBTI. The study of Hammer and Kummerow (2001) involved one adult sample from a few professions, and a second sample of community college, undergraduate, and graduate students in education, psychology, and culinary arts. The first group was 72% female and the second group was 59% female. The study of Myers *et al.* (1998) involved two samples of university students one of which had an average age of 21 and the other of which was had an average age of 19.

Results of both studies relative to the SII GOT scales and the MBTI were very similar. Among the strongest correlations relative to the SII GOTs and the MBTI were

those involving the MBTI components Extraversion (E), Intuition (N), and Sensing (S) with the Social (S), Artistic (A), and Conventional (C) SII codes, respectively. These findings were consistent in both studies.

Although newer versions of the MBTI and the SII than in previous studies were utilized in the studies of Hammer and Kummerow (2001) and Myers *et al.* (1998), these two most recent studies have many of the same weaknesses as the two previously mentioned studies. Although both of these studies mentioned the age range of their research participants, the range has limited generalizability because of its small size. Also, these two studies, like the other two mentioned, utilized the Pearson Product Moment Correlational Technique which is limited in the insights that it can generate because it does not allow for the examination of intercorrelations of predictor variables as described above.

Although some studies have examined relationships among components of the MBTI and the SII, there are four weaknesses common to each of these studies that could make their results most advantageous to counselors in their efforts to make these test results optimally useful to their clients in their career decision making. The first involves the age of the participants of the samples involved in these studies. All of these studies explain the composition of their research samples relative to age, but the reported age of most of the participants was in the low 20's, which limits the generalizability of their results to older populations.

The second weakness is that each of these studies only examined the relationship between two variables at a time using the Pearson Product Moment Correlational Technique. Examining intercorrelations could allow learning of more than simply

relationships between two variables, but relationships between multiple variables for an expanded view of correlations between these two tests.

The third weakness involves the number of components of these two tests that were examined. Not all of these previous examined all six of the SII GOTs with all eight extremes of the four MBTI dichotomies. Examining a set of independent variables in relationship to a set of dependent variables, such the MBTI dichotomies relative to the six SII GOTs could allow a broader understanding of possible correlations between these two tests than previous studies that simply examined one aspect of each MBTI dichotomy at a time relative to each SII GOT.

The fourth weakness involves the versions of the tests involved. All of the previous studies in this area involve versions of both the MBTI and SII that have since been revised at least once and are currently commonly unused.

Learning correlations and intercorrelations about all six of the SII GOTs and the four dichotomies of the MBTI, involving currently used versions of these two tests in an age and gender diverse sample is important so that practitioners can apply generalizations of said research to a broad range of populations. I was unable to find any published research that achieved this aim.

The purpose of the present study, therefore, is to report correlations between components of the MBTI and the SII. As has been shown, interpretations of test scores can be markedly impacted by a counselor's perception of patterns between test scores on both tests. These interpretations may then lead these counselors to explain test score results in ways that are not as informed as if they had known more about typical and

atypical patterns, which can lead to profoundly different career decisions on the part of the career client.

To help the counselor know more about patterns betweens test scores on these two tests, the researcher sought to describe correlations between scores on newer versions of the MBTI and the SII than in previous studies involving clients of a wider age range than in previous studies from a university counseling center. Hence the following non-directional hypothesis was examined: There is a statistically significant relationship between the four MBTI dichotomies and the six SII GOT Realistic.

Method

Participants

The participants involved in this study included 619 clients who requested and engaged in career test administration of both the MBTI and SII instruments at the counseling center of a western, research university within a three year period (10/30/2001 through 10/08/2004). The clients may have been students, private clients, or alumni at the time of the test administration. This number of clients was chosen because it exceeds the minimum $N \geq 50 + 8m$ (*m* being the number of independent variables) necessary for each of the independent variables, in this case the four dichotomies of the MBTI, to use the statistical technique which the researcher utilized (Tabachnick & Fidell, 2001). After securing institutional review board approval from the institution that the researcher is most closely affiliated, archival data including the client's age, gender, scores on both tests, and date of instrument administration was provided by the publisher of the tests with permission of the university counseling center at the university campus

involved in this study. The age range of the participants was 10 – 65 and 427 (69%) of the participants were female and 192 (31%) were male.

Procedures

This study examined each of the four personality preference dichotomies of the MBTI (independent predictor variables) relative to the six GOTs of the SII (dependent criterion variables) using the Canonical Correlational Technique (Cohen, Cohen, West, & Aiken, 2003; Sherry & Henson, 2005; Tabachnick & Fidell, 2001; Weiss, 1972). This correlational test was selected because the data involved in this study is parametric, ratio data and because it enabled the researcher to examine the interdependent nature of each of the independent variables relative to the dependent variables. Also, part of the purpose of this study was to examine the most parsimonious model of independent variables (MBTI dichotomies) that predict the dependent variables (SII GOTs). Because Canonical Correlation determines the strength of prediction of independent variables and notes the error associated with the relationship between independent and dependent variables, this technique was seen as the most suitable option for the purposes of this study.

Although it is typical to report Cronbach's Alpha reliability coefficients for each of the test items in the data used when conducting this type of study, this scoring data was not made available by the publisher for copyright reasons. Previous studies indicate internal reliability (Cronbach's alpha) coefficients that ranged from 0.86 to 0.95 across the four MBTI scales (Myers et al, 1998), and .90 to .94 for the six SII GOTs (Harmon, 1994). Scores generated by the form of the electronic version of the MBTI used by this research sample yield continuous scores that are values of θ resulting from item response

theory. The conversion of the MBTI scores to continuous scores was performed by the publisher of the MBTI. Test reliability of the MBTI was tested using Classical Test Theory until the development of the MBTI Form M, in which Item Response Theory (IRT) has been utilized (Myers et al. 1998). IRT has yielded significant increases in score reliability, as noted in the MBTI Manual (Myers et al. 1998).

Instruments

The basic components of both instruments that are involved in this study are described in table 1. They are described in more detail here.

MBTI *Myers* et al. (*1998*). The MBTI has been used widely in the last half of the twentieth century in various educational, business, and mental health settings. The MBTI is based on the theory of human personality developed by Carl Jung (Myers, 1980). Jung described human personality as being comprised of dichotomous preferences relative to human perception and judgment. Each of the items of the MBTI deals with one of four dichotomies. The questions force the respondent of the assessment to choose one of two responses to each item, from which a preference for one pole or the other of each dichotomy is indicated. The four scales are the following: Extroversion-Introversion (EI), Sensing-Intuition (SN), Thinking-Feeling (TF), and Judging-Perceiving (JP). The EI scale deals with whether people prefer to focus their attention on the external world of people and things (E), or the inner world of ideas and impressions (I). The SN scale addresses whether people prefer to deal with present and concrete information gained from their senses (S), or on patterns and possibilities (N). The TF scale encompasses whether people prefer to make decisions based on logic and objective analyses (T), or values and people-centered concerns (F). The JP scale

measures how people deal with the outer world. Those with a preference for judging (J) prefer a planned, organized approach to life, and those with a perceiving preference (P) tend to prefer a flexible and spontaneous approach to life.

Each of the MBTI items seek to distinguish an examinee's preference on one of the four scales. A four-letter personality type code is generated from the results of an MBTI test administration by listing side by side each of the poles for which the examinee showed a greater preference. For example, if an MBTI examinee's results showed that s/he preferred Extroversion (E) over Introversion (I), Sensing (S) over Intuition (N), Thinking (T) over Feeling (F) and Judging (J) over Perception (P), the resultant four-letter personality type code would be ESTJ.

In addition to describing an examinee's preferences on four bipolar scales, a four-letter type code also relates to an ordered sequence of eight mental processes, also known as functions (Myers, 1998). These mental processes refer to the two inner letters of the four-letter type code: S, or N, and T, or F. Each of these inner letters is discernable by Introversion and Extroversion. The aforementioned test taker with the four-letter type code ESTJ, however, would have the following order of preferred mental processes: Extroverted Thinking (Te), Introverted Sensing (Si), Extroverted Intuition (Ne), Introverted Feeling (Fi), Introverted Thinking (Ti), Extroverted Sensing (Se), Introverted Intuition (Ni), and Extroverted Feeling (Fe).

Jung and Myers assumed that people increasingly develop their less preferred processes as they grow older, but that certain processes are always preferred throughout ones life (Myers, 1980). For example, although the ESTJ previously mentioned will always prefer dealing with their most preferred processes of Extroverted Thinking (Te)

and Introverted Sensing (Si), as the ESTJ grows older, they will develop facility in the use of their non-preferred processes such as Extraverted Sensing (Se) and Introverted Intuition (Ni).

Since the late 1980's, four forms of the MBTI have been available for use: Forms F, G, J, and K. In 1998, Form M, which includes 93 questions in forced-choice format, was made available. The instrument was designed for use with sixth graders through adults. Form M of the MBTI is available in two paper versions including a self-scorable version and a template-scoring version. Form M is also available in an electronically administered, computer-scored version, which uses item response theory to generate more reliable theta scores. The test takers involved in this study used the electronic version of MBTI Form M.

Test-retest reliabilities on the MBTI Form M range from .48 (14 months) to .87 (7 weeks) (Myers *et al*., 1998). Split-half reliabilities range from .67 to .90. Construct Validity is supported by MBTI correlation to other instruments, for example, the MBTI has a .67 - .79 correlation to the Grey-Wheelwright Jungian Type Survey (Myers *et al*., 1998). Internal consistency reliabilities on the MBTI Form M range from .89 to .94 for examinees between the ages of 18 and 70, and between .87 and .95 for college students (Myers *et al*., 1998). Myers & McCaulley (1989) found individuals below age 20 had less reliable scores than older individuals.

As noted in Capraro and Capraro (2002), Harvey (1996) conducted a metanalysis of studies summarized by Myers and McCaulley (1985). Harvey noted that the lowest reliability can be found on the T/F dichotomy, but that across multiple studies, split-half reliability estimates range between .82 and .87 among the four MBTI dichotomies. For

this study, no reliability estimates were made because the dichotomous nature of each scale forces the publisher to convert the scores to continuous scores using IRT. Convertd scores for each item were not provided by the publisher of this test. Reliability/validity variances between the paper and electronic versions of the MBTI have not been noted, but Myers *et al.* (1998) suggests that the electronic version yields greater reliability estimates than the paper/pencil version as Item Response Theory is used to score the electronic version.

SII (*Harmon* et al., *1994*). The SII is based on John Holland's theoretical framework, which states that people can be categorized into six personality types, and that people naturally seek occupations allowing them to rely predominately on the attributes of their type (Dillon & Weissman, 1987). The six personality types are Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E) and Conventional (C) (Harmon *et al*. 1994). The instrument uses 325 items to measure interests in four areas that include interest in work, leisure activities, kinds of people, and work settings. The assessment results are divided into five sections that include General Occupational Themes (GOT), which correspond to Holland's six personality types, Basic Interest Scales (BIS), Occupational Scales (OS), Personal Style Scales (PSS) and Administrative Indexes. Since only the SII GOTs are involved in this study, only they are further explained here.

The SII results report each of the GOTs on a five-point Likert scale to determine the degree to which the test taker has an interest in a particular GOT. The scale includes the following five-points: Very Low (VL), Low (L), Average (A), High (H), or Very High (VH). A RIASEC code is developed based on the two to three codes that have the

highest scores. The six GOTs are Realistic (R), which indicates an interest in building or repairing, Investigative (I), which indicates an interest in researching or analyzing, Artistic (A), which indicates an interest in creating or enjoying art, Social (S), which indicates an interest in helping or instructing people, Enterprising (E), which indicates an interest in selling or managing, and Conventional (C), which indicates an interest in accounting, or processing data.

The SII (1994) has a test-retest correlation range of .91 for 3 weeks to .81 over 3 years. Construct validity was .76 when correlating the Vocational Preference Inventory with the SII themes. Numerous other validity studies about the instrument have been conducted with a variety of populations, including college students. The SII items for this population, had high internal consistency, $\alpha = .97$.

Results

The canonical correlational technique was utilized to simultaneously determine relationships between the 6 SII GOTs and the 4 MBTI dichotomies. In doing this, the researcher first assessed the full canonical correlation model for statistical significance utilizing Wilk's λ (Cohen, Cohen, West, & Aiken, 2003; Pedhazeur, 1997; Tabachnick & Fidell, 2001). The full model was statistically significant with a Wilk's λ of .444, $F(24, 2778.12) = 30.32$, $p < .001$, thus the researcher rejected the null hypothesis that there were no relationships between the two sets of variables. Because large sample sizes can potentially yield statistically significant results from small, unimportant sample sizes (Harlow, Mulaik, & Steiger, 1997), the researcher used the formula that generates the inverse of Wilk's λ (1– .444 = .566 = R^2_c) to determine effect size. The Wilk's λ computation indicated a value of .566 or 57% of the SII GOTs (criterion variables) were

accounted for by the MBTI dichotomies (predictor variables), which the researcher concluded to be a significant enough portion of shared variance to continue with the analysis.

A data reduction analysis helped the researcher to determine which if any of the canonical functions explained enough relationship between variables to be deemed worthy of interpretation (Lindeman, Merenda, & Gold, 1980). The researcher decided to only analyze those canonical functions that explained more than 10% of the total variance as anything less would not be practically significant or likely to be replicable (Cohen, Cohen, West, & Aiken, 2003; Pedhazeur, 1997; Sherry & Henson, 2005; Tabachnick & Fidell, 2001; Weiss, 1972). Because the first two functions yielded 32% and 25%, respectively, and the third and fourth functions each explained less than 10% of the total variance within their functions, the researcher analyzed only the first two functions. The canonical correlations and the structure coefficients from the canonical analysis for the SII GOTs and the MBTI dichotomies are depicted in table 2.

The first canonical correlation, was mostly defined by the relationship between the SII GOTs Artistic (.827, 80% of the variance), and Conventional (-.407, 55% of the variance) among the criterion variables and MBTI Intuition (.937, 99% of the variance) and Perceiving (.119, 49% of the variance) among the predictor variables. High scores on SII Artistic and low scores on SII Conventional are highly related to MBTI Intuition and MBTI Perceiving. The second canonical correlation was mostly defined by the criterion variables SII Social (-.762, 66% of the variance), SII Realistic, (.470, 55% of the variance), SII Investigative, (.417, 49% of the variance) and the predictor variable

MBTI Thinking (-.954, 85% of the variance). Low scores on SII Social, and high scores both on SII Realistic, and SII Investigative are highly related to MBTI Thinking.

Discussion

Previous research examining relationships between MBTI dichotomies and the SII GOTs were analyzed using the Pearson Product Moment Correlational Technique, involved participants that were mostly Caucasian, male, university students between the ages of 18-22, utilizing versions of the MBTI and SII that are no longer in common use (Apostal, 1991; Dillon & Weissman, 1987; Hammer & Kummerow, 2001; Myers *et al*., 1998). In contrast the present study involved a more diverse research sample relative to age range and gender, and was the first known study in this area to examine multiple predictor variables against multiple dependent variables in one statistical analysis. The goal of this study was to examine the nature of correlations between all of the SII GOTs and the MBTI dichotomies simultaneously.

Results from the first variate revealed two unique roots that accounted for interpretable amounts of variance. Interpretation of this first canonical root suggests that the SII GOTs and MBTI preferences that are most likely to occur simultaneously are the tendency to prefer SII Artistic, but not SII Conventional endeavors as well as a preference for MBTI Intuition and MBTI Perceiving. This root accounted for the greatest amount of explained variance between the criterion and predictor sets of variables. SII Artistic and not SII Conventional interests as reported from the SII seems to be highly related to a preference for dealing with patterns and possibilities (MBTI Intuition) in a flexible and spontaneous manner (MBTI Perceiving) as reported in the MBTI (Myers et al., 1998). The second variate suggests that high SII Realistic and SII

Investigative as well as low SII Social interests are highly related to a high preference for making decisions based on logic and objective analyses (MBTI Thinking).

These results were consistent with many of the previous studies that examined relationships between client scores on these two tests. The highest relationships found between the MBTI dichotomies and the SII GOT's both in our study and in previous studies were between MBTI Intuition and SII Artistic (Apostal, 1991; Dillon & Weissman, 1987; Hammer & Kummerow, 2001; Myers et al, 1998). Also consistent with previous research, the second highest relationships were between MBTI Judging and SII Conventional (Dillon & Weissman, 1987; Hammer & Kummerow, 2001; Myers et al, 1998) and the third highest relationships were between MBTI Thinking and SII Realistic and SII Investigative (Dillon & Weissman, 1987; Hammer & Kummerow, 2001; Myers et al, 1998).

Overall, the findings suggest two common patterns in scores between both tests. The test scores that are most likely to occur simultaneously reveal a client with high interests in careers that allow them to be highly artistic and nonconventional exploring possibilities which have not yet been explored in a flexible and spontaneous manner. The scores between both tests that are second most likely to occur reveal a client with an interest in building or repairing, researching or analyzing who prefers to make decisions based on logic and objective analyses and is not very interested in helping or instructing people.

Implications for Career Counseling

Counselors have often made assumptions about what are and what are not typical test score patterns when both of these tests are administered. As was mentioned earlier

in this paper, a counselor might assume that a client who scores high on MBTI Intuition, for example, will also be likely to score high on SII Artistic. These assumptions have been largely supported based on the counselor's experience jointly administering and attempts to interpret these two tests, and the previous research in this area. The purpose of this study was to discover if many of these assumptions are true. The researcher felt that exploring these assumptions was necessary both because the differing populations that counselors work with might offer variations in these common test score pattern assumptions and because previous research that examined these relationships between these scores had several limitations in terms of participant characteristics and test versions examined.

The results of this study were very similar to results of previous studies in this area. Basically, the score that is most likely to occur in both tests at the same time is a client who is highly creative, preferring to explore ideas that have not yet been explored in a flexible, spontaneous manner. The second most likely score between both tests relates to an individual with very hands-on interests that allow them to research or analyze issues from a logical, rational perspective. Because these correlations are very similar to those of previous studies the conclusion can be made that examining these relationships in a more age and gender diverse sample using newer versions of these career tests than in previous studies has not changed the patterns of career test score relationships.

Basically, the assumptions that many counselors who use these tests have made about what are typical and atypical test scores on these two tests are correct. Where these conclusions were once made based only on professional experience and research

that involved older versions of these tests and participant groups that were largely comprised of male, university students in the age range of approximately 18-22, counselor conclusions can now be based on newer versions of these career tests and on at least one study that examined the relationships in a more age and gender diverse sample than previously.

Where a counselor might have before concluded that a male 18-22 year old university student with a score of MBTI Intuition and SII Artistic was typical based on experience and the limited research in this area, this same counselor can now make the same conclusion for a female, middle-aged woman whose test scores are the same. Because these traditional assumptions about typical and atypical test scores were supported by this research, counselors can view their test scores differently than before. Where they might have before wondered about differences in career test score patterns by age, gender or the version of these tests used in the past, this research offers support for the conclusion that these patterns of test scores are consistent based on these variables. This frees the counselor to consider others issues when striving to understand these scores and make sense of them for their clients.

One might think that if one can easily predict a score on one test based on the score of the other that there is hardly a reason to use the second test. Why bother using two tests when you can predict the score of the second test based on the results of the first? While this seems reasonable, there are also many other combinations of scores that a career test taker might generate. For example, just because an individual scores high on MBTI Intuition and MBTI Perceiving this does not necessarily mean that this individual will always score high on SII Artistic. The individual who scores high on

MBTI Intuition and MBTI Perceiving might score high on SII Realistic, SII Conventional or other SII GOTs which are not typical as this and previous research have indicated, but the possibility of these combinations occurring is always present and is the point of using more than one test: to gather and learn more information than be attained from the results of one test.

The view of this researcher is that those who use both of these tests should not, based on the results of this study, be persuaded to use only one test. This is because although the most common scores that will occur simultaneously across both tests is evidenced both by the results of this study and previous studies, there are many other possible scores that are possible. The purpose of using more than one test is to gather more information than one test can provide and it is unclear how many individuals who score high on one test will also score high on particular aspects of another test.

Future Research Implications

Perhaps more important than a counselor considering whether to use one test or two are the implications of the scores that occur most often. It is perplexing to think about why the scores that most occur simultaneously are MBTI Intuition and Perceiving and SII Artistic and secondly MBTI Thinking and SII Realistic and SII Investigative. These findings have the potential of comprehensively altering the way that we conceptualize human personality, career interests, intelligence, and wisdom. The researcher will explain these conceptual implications of these findings as well as applications that go beyond career counseling to include educational programs for children, workplace training programs for adults, therapeutic interventions for those needing assistance with hope to cope with perceived psychological disabilities, or many

other areas in which individuals daily strive to understand and cope with human diversity.

Are individuals who generate high scores on MBTI Intuition and SII Artistic and or MBTI Thinking and SII Realistic and SII Investigative more secure in their personality preferences, career interests or both? One area of inquiry based on these findings would be to investigate other personality aspects of individuals who have these same scores. Do they tend to live their lives in similar ways or have similar interests? As Howard Gardner's (2006, 1993) work on intelligence delves into discovering the strengths that individuals have relative to different intelligences, it would be interesting to learn if a group of individuals with high scores on MBTI Intuition, MBTI Perceiving and SII Artistic, for example, generate high intelligence scores in the same of Gardner's proposed intelligences.

As some intelligence researchers have moved beyond examining individual strengths in particular areas and looking instead at the abilities to achieve what the individual deems to be success (e.g., Sternberg, 2003), it would be interesting to relate findings of this study to recent literature about wisdom. Sternberg (2006), for example, asserts that those with practical wisdom are those who are able to capitalize on their strengths and compensate for their weaknesses in ways that make them feel successful. It would be interesting to discover the degree to which individuals with high MBTI Intuition, MBTI Perceiving and SII Artistic preferences or MBTI Thinking and SII Realistic and SII Investigative preferences are able to do this. Are the former more or less likely to be able to do this or are they less diversified and able to adapt to situations that do not allow them to use their creative, out-of-the-box perspective to understand

concepts and solve problems? Likewise are the latter more or less likely to be able to think outside of the box and therefore adapt to new life situations as they present themselves? It would seem that an individual who generates scores that seem intrinsically different than these two might be more adaptable to different life situations that require them to use different kinds of reasoning or thinking, for example someone with a high MBTI Intuition and SII Realistic preferences. Or is it that someone with such a palpable strength at thinking outside the box (MBTI Intuition and SII Artistic) is more adaptable in different life situations than others because their abilities to think creatively are so strong and that someone who prefers doing things in rational, logical, ways in structured environments (MBTI Thinking and SII Realistic and SII Investigative) is more able to adapt to life because they are more likely to fit new circumstances into their predetermined, logical framework? These are questions that could inform future studies about the nature of human intelligence.

Teachers and students could benefit from knowledge of children's personality preferences and interests as reflected by tests such as the MBTI and the SII. For example, if a student, who will be referred to here as Johnny, scores high on MBTI Intuition, MBTI Perceiving and SII Artistic, his teacher might be informed that Johnny may have unusually exceptional talents and interests in particular subjects that are quite unique from other students. Because Johnny's test scores are not as diverse as other students who might not have scored high on two constructs that seem to measure such similar qualities, it may be that Johnny has difficulty adapting to situations where he needs to utilize many different types of mental activities that do not include his unique ability to understand concepts from novel, unusual perspectives. Likewise, if another

student, who will be referred to as Emily, prefers MBTI Thinking and SII Realistic and SII Investigative, her teacher might better be able to work with Emily if she were able to prepare in advance for a student with a preference for a structured, ordered lesson plan that enables her to categorize newly learned material relative to previously learned material. Understanding this about Johnny and Emily in advance of working with them would help their teacher potentially create learning situations that help them use their unique talents to understand concepts that are new to them as well as adapt to situations when they are simply unable to use these unique talents, which they would prefer to use.

In the same way that communications could be improved between teachers and students, mental health professionals could benefit from this type of knowledge to help them prepare before assisting their clients, corporate trainers when striving to create adult learning environments that help employees develop essential workplace skills, supervisors in deciding which work tasks to assign to particular subordinates, spouses in their efforts to organize household chores, and many other individuals who strive to understand and cope with human diversity.

Limitations

Despite the insight that these findings provide to career counselors, there are several limitations that future researchers might wish to account for in future research. First, while the number of participants involved in this study was considerably larger than those of previous studies in this area, these participants were students or clients of a highly prestigious research university. Career practitioners working with, for examples, clients in religious institutions, corporate executives, especially outside the United States, or even college students that are not related to prestigious research universities

may not feel they can completely generalize the results of this study in their understanding and decision making about their clients' test scores. Future research, therefore, might study similar relationships with different populations in religious settings, or other higher education and business settings toward building a theory about scores between these two tests.

Age, gender, and ethnicity are also significant to note. While this study involved a larger age range than in previous studies in this area, larger concentrations of the participants were in their 20's than in any other age range and the numbers of participants lessened as age increased. Future studies would provide more insight in this area if they involved larger numbers of participants that were in their 30's and older. While the gender of the participants in this study were noted, this study involved 2/3 females like previous work in this area. Future studies would expand our knowledge in this area if they explored these relationships among a group of participants that included more males. Finally, ethnicity was not noted in this study and was also not noted in previous studies. Possible ethnic differences in these test scores could certainly expand our knowledge of personality and career interest differences across various cultures.

Other weaknesses relate to reliability and acquisition of the test score data. While both the MBTI and the SII are considered to be reliable, as noted above, the fact that no reliability differences in the paper version vs. the online version of either of these tests are available, is a limitation. The publisher of these tests would not reveal the exact method by which the MBTI test scores were converted from dichotomous scores into continuous ratio data. Although obtaining the data from the publisher in this way is common practice for researchers conducting similar research (Myers et al, 1998),

knowing the exact procedure would offer replicability of a study such as this more so into the hands of researchers and would thus give the results greater credibility. Also related to obtaining the test score data for research, the researcher was unable to analyze Cronbach's Alpha reliability coefficients for these two tests because the scoring information about these two tests was not made available by the test publisher. Future researchers might wish to try to overcome this weakness in this study.

CHAPTER IV

AGE AND GENDER DIFFERENCES IN CLIENTS' SCORES ON THE *MYERS-BRIGGS TYPE INDICATOR* AND THE *STRONG INTEREST INVENTORY*

Introduction

This study seeks to examine possible age, and gender differences in scores on the *Myers-Briggs Type Indicator* (MBTI®) (Myers, McCaulley, Quenk & Hammer, 1998), and the *Strong Interest Inventory* (SII™) (Harmon, Hansen, Borgen, & Hammer, 1994). Men and women differ greatly in their interests relative to career as they age. Because of these differences, a counselor's knowledge about differences in client scores based on these variations would help them understand their client's career test scores, resulting in enhanced client understanding of the results, which would lead to more informed client career decisions. Although differences by age and gender have been investigated, the degree to which these possible differences have been investigated varies.

Based on Jung's theory of 16 psychological types, the MBTI is a personality inventory that has long been used in business, education, and mental health settings as well as career testing (Jung, 1923). The SII is a career interest inventory that has been used specifically to measure career interests and it is based on the John Holland's theory of six occupational interests (Holland, 1977). Of the many career tests that are accessible, the MBTI and the SII for this investigation because they are considered to be among the most popularly used (Hammer & Kummerow, 2001; Dillon & Weissman, 1987; Watkins, Campbell, & McGregor, 1988) and because the MBTI is considered

useful to use with the SII as it helps the career client understand their personality in multiple contexts beyond only those of careers (Harmon, *et al*., 1994).

When faced with the question of how to help a career client understand their career test results, data as to how often females or males of particular ages tend to score high on certain career interests could assist a counselor in helping their client understand how to help the client make meaning of the career test results in their lives. For example, if a woman who is age 25 scores high on Artistic career interests and not many women of her age tend to do the same, a counselor might approach her understanding and interpretation of such findings to the client differently than if the client's results were more typical of other 25 year old females.

This is not to say that there is anything wrong with an individual taking a career test and generating a score that is not typical of others that are the same age, and/or gender as herself, but implications of scores on a career test for an individual whose scores are very different like others are significant. If counselors have more information about what are typical or atypical scores for their client's age or gender it would enhance their understanding of how to assist their client in making sense of the scores in relation to their particular age and gender. As a career testing client, it would be helpful to know these age and gender differences in terms of whether or not there are many others who are similar looking for work or seeking academic training in particular fields. Certainly it is nice to know what you are up against when you are pursuing any life goal, and in the case of career endeavors, knowledge for a career client as to how many others of their age and/or gender who tend also to pursue these types of careers could be informative.

In summary, the more a counselor knows about patterns of differences in career test scores by age and gender, the more implications can be made from the results, and the more informed career decisions can be made by clients. Since the MBTI and the SII are among the most popularly used career tests, it seems reasonable that these two tests need to be investigated for possible score differences in these ways. To further explain the need for this investigation, the researcher will further explain literature about age and gender differences, offer a brief overview of the MBTI and the SII, and describe a research study the point of which was to enhance our understanding of age and gender differences on these tests.

Review of Research

Gender Differences in Career Development

A pioneer in the area of gender studies, Carol Gilligan was among the first to assert that women when are fundamentally different in the way that they understand and deal with basic problem solving. In reaction to Lawrence Kohlberg's (1968) moral development theory wherein he asserts that all individuals develop an increasingly rational, rules-oriented perspective on moral decision-making, Gilligan responded by asserting that women take a more caring, nurturing approach to moral problem solving (Gilligan, 1982). Although Kohlberg viewed this approach as a lower level of moral development, Gilligan described it as a fundamental difference between men and women that should be valued and respected.

In terms of career development, Astin's (1984) work was among the first to assert that the career development literature had overly focused on seeking to discover one universal career developmental theory, which lead her to advance a theoretical

model that suggests that men and women differ in their career expectations and hence career choices and behavior. Although career development has been written about since the early 1900's (e.g. Parsons, 1909), and despite a fair amount of literature about gender differences in career development beginning approximately in the 1970's (Farmer, 2006; Lonborg & Hackett, 2006), a theory of women's career development has not emerged. This has been due in large part to the conflicting literature about differences that may or may not be significant in the career development of men and women (Gati, Osipow, & Givon, 1995; O'Brien & Fassinger, 1993; Fitzgerald & Crites, 1980; Fitzgerald & Betz, 1983).

The literature suggests that men and women experience gender specific career-related learning situations (Williams & Subich, 2006; Betz, Harmon, & Borgen, 1996), have more positive outcome expectations for traditionally gender specific careers (Lent, Brown, & Hackett, 1994), and develop greater self-efficacy in traditionally gender specific careers (Betz & Hackett, 1981). These findings imply significant differences in the ways that women and men perceive themselves relative to careers based on their career-related learning experiences. These findings also suggest that men and women may develop career interests throughout the lifespan differentially. This proposed study seeks to illuminate our understanding of these potential differences in an effort to assist administrators of career tests in helping their clients make sense of career test results.

As we know, men often traditionally assume male gender roles such as providing financially for their families in contrast to women who traditionally assume female gender roles like taking primary responsibility for child-rearing and other household maintenance-oriented tasks. Research about the degree to which men and women

assume these seemingly traditional gender roles relative to career; however, illuminate environmental and biological influences on the career decision making of men and women. This research will be explained here as it brings to bear the importance of research that examines gender differences in career test scores on the MBTI and the SII.

Differences in Career Perceptions. As we have noted above, careers perceptions often differ for men and women, but these perceptions seem to change with life experience. This may be because of differing responsibilities assumed by men and women. For example, it has been asserted that issues of career choice are much more complicated for women than men because women often perceive that higher status career choices bring with them more potential complications regarding family development they might experience (Farmer, 1997; Tipping, 1997; Farmer, 1971; Harmon, 1978). This is in contrast to men who may perceive themselves as experiencing fewer obstacles to their attainment of high prestige professions. Perhaps because men less often make their career choices based on family development issues, Luzzo and Hutcheson (1996) and Luzzo and McWhirter (2001) found that women perceived themselves as having more educational and career barriers than men. Post-Kramer and Smith (1985) found that 8th and 9th grade males and females tended to have similar perceptions of their abilities in male-dominated professions especially law, drafting and engineering.

Another significant difference between men and women is the role that career plays in ones life. Larson, Butler, Wilson, Medora & Allgood (1994) found that men were more likely to delay career choice commitment because they perceive career choice to be a more permanent decision than women, who often perceive career as only one of

many significant aspects of their lives. Men may perceive a less than perfect career choice as having a far more devastating effect on the lives of themselves and potential life partners than women.

Despite these differences in perceptions of careers, both sexes seem to perceive barriers to career success in their young adult years. Swanson and Tokar (1991), for example, found that college age students perceived significant career barriers before them, but perhaps surprisingly found no significant gender differences in the type or degree of these barriers and Luzzo (1995) found that college age women generally exhibit greater career maturity than men specifically related to decision making skills, career attitudes and congruence with particular chosen careers. Clearly reasons for these gender and age discrepancies need to be investigated, and an initial investigation into these factors that influence career decisions will be the first step in such a process. The following description of research about these issues will explicate environmental influences such as family members and other significant social connections, and perceptions of particular careers relative to gender norms.

Environmental Influences. Zytowski (1969) investigated potential factors that influence women's career choices, especially those that might be nontraditional relative to their sex. While, as his research affirmed, definitive conclusions on this subject are illusive, he was among the first to call for further investigation into the environmental factors that influence women's career choices. Harmon (1989) found differences in the career aspirations of two groups of college freshman women. The groups represented college freshman women from the same institution a decade apart. The second group expected to work throughout more of their adult lives than the first group and aspired

more to business fields than liberal arts fields in comparison to the first group. This research implies that women perceive themselves as having increasingly diverse career opportunities; certainly more than in the past.

Despite the perception by women of ever expanding career options, social/environmental influences seem to differentially affect males and females in their career choices. Danziger (1983), for example, found that men were more influenced by their perception of their academic achievement and ability in their career choices, in contrast to women who were more influenced by social origins (e.g. SES, parental influences). Men have also been found to more likely be influenced in their career by teachers or other mentors outside the family than females and the inverse has been found to be true for females (Farmer, 1985). Although Danziger's (1983) report implies that men are less influenced by family members in their career choices, other reports suggest that men have a need for approval and emotional connectedness from parents relative to their career choices (Lucas, 1997).

These conflicting reports about parental influences on male career choice are further complicated by ethnicity and the presence and marital status of parents. Specifically, Flores, Navarro, Smith, and Ploszaj (2006) found that Mexican American men who had high self-efficacy about nontraditional careers, high parental support for nontraditional career choices, as well as fathers who had made non-traditional career choices, more often chose non-traditional careers themselves. This would imply that family experience with nontraditional careers seems to more often influence men to pursue nontraditional careers.

Lemkau (1984) found that men whose parents were divorced, who experienced the death of a parent, reported high career influence from their mothers, or a distant relationship with their father all had a higher tendency to pursue traditionally female-dominated professions than those who did not. These same men reported that many of these career influences, "sensitized them to their nurturant and emotional capabilities" (p. 1).

Based on these conflicting reports, it is clear that there are many influences on the career choices of men and women. As the following will describe, although family or other social influences play a significant role in individual career choice, a growing body of literature describes patterns about the degree to which men and women choose careers that are traditional or nontraditional for their gender. We begin this examination by describing literature about perceptions about the masculinity or femininity of particular career fields.

Career Femininity/Masculinity. In this section we describe literature that deals with male and female perceptions of career fields. Grotevant and Thorbecke (1982), for example, found that high school men and women perceive the concept of career differently. Survey results revealed that both men and women associated vocational identity with masculinity, but that men also associated it with lack of concern for the opinions of others and women also associated vocational identity with hard work. Males also perceived exploration of careers as a feminine rather than masculine trait. Women also perceived competitiveness as negatively related to the development of vocational identity.

Other studies by Harmon (1981; 1972) revealed differences in the numbers of women who were choosing to pursue traditionally male-dominated career fields. She surveyed women six years after they were about to enter college to observe trends in their career choices among other things in relation to her previous study (1972), which examined the same issues. Although many women in both samples pursued very conventional life goals including pursuing traditional female dominated careers such as education or other social services fields, compared to her previous study, the more recent study found more women choosing traditionally male dominated careers including, doctor, professor and business careers. Contrary to their hypotheses; however, Jome and Tokar (1998) found no significant differences in desire to assume traditionally appropriate male family and spousal roles among either those who scored high on masculinity or femininity.

Jome and Tokar (1998) found that those who held traditionally male-dominated jobs more often endorsed anti-feminine and toughness social norms than men who held traditionally-female dominated jobs. Not only have career masculinity preferences on the part of men and the femininity for women been found, but Gianakos and Subich (1988) found that not only do both men and women tend to make career choices that are traditional for their sex, but women who score a high degree of masculinity (also Chusmir, 1983) or men (also Chusmir, 1990) for femininity on the *Bem Sex Role Inventory* (1981, 1978) tend also to choose careers that are nontraditional for their sex. This research implies that the greater degree of masculinity a man reports or femininity for women, the more likely they are to choose careers that are traditional for their sex.

While these results may seem easily understandable and not so significant to address, the findings of Fitzgerald and Cherpas (1985) imply a bias on the part of mental health professionals in working with those who align with these social norms. The specifically found that counselors were less likely to work with male clients who wanted to work in nursing, a traditionally female dominated profession. Contrary to their hypothesis; however, a higher proportion of the same counselors were willing to work with women who were aspiring to become physicians, a profession which is traditionally male-dominated. It seems from this work that the perceived degree of masculinity or femininity of an individual's career choices may have a profound affect on the way they are treated by other professionals. While this study does not seek to explain the reasons why individuals make traditionally masculine or feminine career choices, this literature has been described here as further research in this area may be illuminated by results of this study which seeks to describe relationships between career test scores.

Career Choice Traditionality. Some have argued that gender issues in career assessment have often been categorized as psychopathological issues considered to be necessarily treated in much the same way as other psychological deficits, inadequacies or ailments (Bograd, 1984; Brown, 1990; Brown, 1986; Kaplan, 1983). Others have suggested that certain client behaviors that are not considered gender normal in the United States are often psychopathologized by mental health professionals (Root, 1985). Auster and Auster (1981) were among the first to describe a lack of research literature connoting discrepancies in gender representations within certain professions. In their investigation into this issue, they found that an often difficult to describe combination of

environmental influences typically lead individuals to make gender non-traditional career choices.

Lonborg and Hackett (2006) affirm that there are no notable sex differences among client scores on the MBTI personality test, but career interest differences have been noted in that women tend to score a preference for Social careers (e.g. teaching, nursing) in contrast to men who tend to score a preference for Realistic careers (e.g. technical fields such as engineering) (Farmer, 2006) on the SII.

Both men and women are more likely to choose careers that they perceive as being traditional for their gender (Harren, Kass, Tinsley & Moreland, 1979), although among women, high socio-economic status (SES) adolescents are more likely than those of low SES to choose predominately male dominated professions (Hannah & Kahn, 1989). Hayes (1986) asserted that where much research argues that women need to pursue more male-dominated career fields to achieve gender equality in various professions, men likewise need to pursue more female-dominated career fields toward this same aim. Although balanced gender-representation within professions generally seems to be a noble cause in terms of ensuring gender equality, these gender equity efforts could be limiting if men and women develop perceptions that they should choose particular professions because they are underrepresented by their gender and not solely based on their interest.

Influence of Career Prestige-Level. The issue of prestige-level involves, for example, the degree of financial earning potential and social prestige that a career decision maker associates with a particular career. Leung and Harmon (1990) and Leung and Plake (1990) tested Gottfredson's (1991) model of career circumscription that

asserts that people are more likely to choose a career based on a careers sex type, or the individuals perception of which gender traditionally dominates it. The findings of Leung and Harmon (1990) affirm Gottfredson's theory in that men and women similarly reported pursuit of careers based on their prestige level, but that men were less likely than women to pursue prestige careers if they perceived them as being traditionally dominated by the opposite gender.

While these researchers found sex-type to be more important to men than prestige level, Leung and Plake (1990), in contrast, found that prestige level overrided sex type in importance to both men and women. Although Tokar and Jome (1998) found consistencies with Gottfredson's theory similarly to Leung and Harmon (1990), their findings revealed inconsistencies in pursuit of sex-type careers based on particular career interests.

MBTI – Gender Differences in Scores

Hammer and Mitchell (1996) found that both men and women prefer introversion and judging more than their opposites; extraversion and perceiving, respectively. They found, however, that more men prefer intuition over sensing and thinking over feeling and the exact opposite for women. Their sample included a group of approximately 1,800 males and females age 18-94 from throughout the United States who completed either the since revised MBTI Form G or the Murphy-Meisgeier Type Indicator for Children (MMTIC, Murphy & Meisgeier, 1987). This is consistent with previous research in this area by McCaulley, Macdaid, and Kainz (1985), which involved three samples totaling more than 250,000 individuals. The one difference is where Hammer and Mitchell (1996) found both men and women to prefer introversion more than

extraversion, this previous study found that more women than men preferred extraversion. The reason for this difference is unknown, but if this study supports this previous finding, it might illuminate our understanding of this difference.

SII – Gender Differences in Scores

Unlike the single current version of the Strong Interest Inventory as well as other career-related instruments, E. K. Strong initially created both a male and female version of his first interest inventory in the late 1920's and early 30's (Harmon, *et al*., 1994). Strong did this both because the item responses of men and women were markedly different and because large percentages of women primarily held traditional, full-time homemaker roles unlike the workplace of today which comprises a much larger percentage of female workers than in the past.

As the 20th century progressed, difficulties arose about which instrument to use with particular clients (Harmon et al., 1994). For example, some counselors chose to use the male-specific instrument with female clients that they deemed to be more career-focused than other women Because of confusion over usage issues such as this, a single Strong Interest Inventory was developed in 1974 and the tradition of maintaining only one Strong instrument has continued.

Despite this streamlining of instrumentation, gender differences have continued to occur in SII test scores. Generally, men have been found to score higher on SII Realistic and Investigative than women and women score higher than men on Social and Artistic. This was reported in research on the 1981 SII (Lapan, Boggs, & Morrill, 1989; Hansen, Collins, Swanson, & Fouad, 1993), later supported on the 1994 version (Hansen, Scullard & Haviland, 2000), and has been supported in groups of various

ethnicities and ages including African Americans (Fouad, 2002; Fouad, Harmon & Borgen, 1997; Hines, 1983; Swanson, 1992), Asian Americans (Fouad, Harmon & Borgen, 1997), Latinos-Hispanics (Fouad, Harmon & Borgen, 1997; Montoya & DeBlassie, 1985), Caucasians (Fouad, Harmon & Borgen, 1997), and Koreans (Tak, 2004).

Williams and Subich (2006) found that men report more often experiencing learning situations that allow them to develop interests within the SII Realistic and Investigative domains while women report more learning experiences in the SII Social domain and Lapan, Boggs and Morrill (1989) noted that their results may be related to self-estimates of ability or personal effectiveness expectations in both men and women. The implication is that women may have less confidence in their abilities to build or repair (Realistic), or research or analyze (Investigative) than men. From this one might infer that men develop a greater self-efficacy for careers that correspond to these interests, which might be perceived to coincide with many gender-specific stereotypes. This inference is supported in the results of Betz and Hackett (1981) who found that men reported greater self-efficacy in traditionally male dominated careers as compared to women and the inverse regarding traditionally female dominated careers.

In line with this research that implies consistency with gender-role stereotypes in career choice, Lent, Brown and Hackett (1994) suggest that the self-efficacy that men and women develop relative to particular occupations is related to their outcome expectations and differential, career-related learning experiences. Betz, Harmon, and Borgen (1996) likewise found that men and women's interest patterns on the SII were largely consistent with these gender-specific, occupational, social norms.

Clearly all of these works suggest that men and women tend to experience greater comfort and confidence when choosing careers that seem to align with many commonly held gender-role stereotypes. There are two central reasons why it is important to examine relationships between these two career tests by gender. As this study seeks to illuminate it will be particularly telling to find out the potential degree to which a gender-specific pattern, as described above, would be found between both of these tests. While a test administrator would certainly not choose to tell a client that they should pursue a particular career simply because it is the choice of many others of the clients gender, knowing this information might be deemed as helpful to a client who wants to be aware of the fact that, for example, there are more men than women in a particular career field.

Another significant reason to pursue examining gender differences among career test results is to illuminate gender differences across the lifespan. All of the studies noted above about gender differences involved traditional-age college students. While the results of these studies are clearly helpful to a career test administrator who is working with college students, findings that are the result of a study involving clients of a wider lifespan would certainly be more helpful than the previously mentioned studies to career tests administrators who work with clients who are older than traditional-age college students.

Age Differences in Career Development

Based on a survey of workers of different ages, Gursoy, Maier, and Chi (in press) have described differences in the work-related values of three generations of workers. Born within the twenty years just after World War II, the baby boom generation is at or

close to retirement and baby boomers are described as comfortable with a workplace comprised of a hierarchical, top-down administration. Born between 1960 and 1980, the Generation X-ers prize instant gratification, a rebellious attitude, and a work to live attitude as opposed to their live to work baby boomer counterparts. Born since the early 1980's, the millenials prefer a workplace of collective action, optimism for the future, and take comfort in a centralized administration.

Where baby boomers are comfortable loyally waiting their turn for promotions, younger generations are often retaining promotions that others who are their parent's age might expect to earn only after extended time. These workers, competing for the same jobs that are of various levels are working together and with their different values, are shaping the world of work. Because these workers have such different values about what the workplace represents and their role within it, it follows that they likely have many differences in career personality and interest preferences.

The career development literature has taken a piecemeal approach to explaining age differences in career development. Although the literature reveals some insight about career development of young adults (Swanson, 2003; Powers & Rothausen, 2003; Tracey & Robbins, 2005; Jacobs, Chhin & Bleeker, 2006) and to a lesser extent older adults (Robson, Hansson, Abalos, and Booth, 2006), there is a significant lack of published material that offers insight into career development issues of children (Watson & McMahon, 2005). Likewise, mid-career development has been neglected both in the career development research literature and in practice in the world of work because the vocational psychology literature has primarily focused on initial career choice, which is

often associated with late adolescent and traditional college age adults (Swanson, 2003; Powers & Rothausen, 2003).

Despite the lack of published work about certain age groups regarding career development, adolescent and young adult career development informs us that adolescents' maintain fairly stable career interests throughout their high school years (Tracey & Robbins, 2005), and that their career choices are highly influenced by their parents (Jacobs, Chhin & Bleeker, 2006). Also, literature about workers who are more advanced in their career development suggests that older workers are most concerned with physical health issues and adaptability of their skills to the world of work as opposed to other career-related issues like, for example, developing and maintaining positive relationships in the workplace (Robson, Hansson, Abalos, and Booth, 2006).

Although there is arguably ample published research about the career development of adolescent, young adults and to a lesser degree older adults, these data are irrelevant to a career counselor who is trying to help their client with their mid-career decisions. Despite the relevant information that the published career information about adolescents and young adults can provide to a career counselor who is working with someone within that age range, that career counselors' perspective could certainly be broadened and informed by more information about career development throughout other parts of the lifespan.

SII/MBTI – Age Differences. In addition to a lack of knowledge about the career development of midcareer and older adults, little has been discovered about age differences in scores on the SII. Fouad (2002) studied differences in GOT scores among a group of students and a group of professionals. The professional group, whose average

age was 40, reported overall weaker scores on all six GOTs than the student group. One might conclude from this finding that as one develops more career experience their career interests become more diversified into more areas, but weaker within each. This conclusion, however, assumes that those with who have completed less college education have less career experience. Although this one study provides some insight into possible age differences in scores on the SII which could be helpful to those who administer career tests, no other published studies were found to support these findings.

Only a handful of studies have explored age differences in MBTI types. Carl Jung's (1976) theory, which the MBTI is based upon, includes the assumption that psychological type preferences do not vary with age (Myers, McCaulley, Quenk & Hammer, 1998). Despite this, three studies have explored possible variations in type as one ages. As Cummings (1995) noted, previous studies examining age variations in type have involved populations of high school students (Myers, McCaulley, Quenk & Hammer, 1998), (Myers & McCaulley, 1985).

In contrast, Cummings (1995) examined 1000's of individuals of many diverse characteristics such as 15-20 year olds, high school dropouts, adult college graduates, adults over age 50. He found that both men and women tend to exhibit more Intuition as opposed to Sensing and Thinking as opposed to feeling preferences in their middle age. Both men and women tend also to prefer the opposite both as younger and older adults. Cummings also found that women decreasingly score high on extraversion as they age. As with the SII, although these findings are insightful, further study into the nature of MBTI types preference differences by age would increase our knowledge into

personality development throughout the lifespan and offer administrators of these tests additional insights to inform their interpretations of the career test results for the clients.

Clearly there is a marked lack of literature about age differences in SII GOTs and MBTI types and although there is arguably ample published research about the career development of adolescent, young adults and to a lesser degree older adults, these data are irrelevant to a career counselor who is trying to help their client with their mid-career decisions. Despite the relevant information that the published career information about adolescents and young adults can provide to a career counselor who is working with someone within that age range, that career counselors' perspective could certainly be broadened and informed by more information about career development throughout other parts of the lifespan particularly in relation to scores on these two popularly utilized career tests.

A Lifespan Developmental Perspective. Many life-span development theories have illuminated our understanding of how people differ as they age (Salkind, 2004). Among the more prominent are those of Jean Piaget (Piaget, Inhelder, 2000) and Erik Erikson (Erikson, 1963) whose theories imply an increasing ability of people to problem solve and perceive their world in ever more sophisticated ways (Salkind, 2004). Within the vocational psychology literature, the developmental theory of Donald Super (1994) seems to be the most widely respected theory of career development (Walsh & Osipow, 2005; Brown & Associates, 2002; Osipow & Fitzgerald, 1996). As Osipow & Fitzgerald (1996) explain, "no one has so intricately woven developmental hypotheses into career development as successfully as Super" (p. 110). Super claims that adults of any age seek to implement whatever career they feel will optimally help them express themselves and

the career they choose and how the implementation takes place is a function of their age and environmental influences. Specifically, Super advanced a career development theory of 5 stages including: growth (young adolescence, ages 4-13), exploration (adolescence, ages 14-24), establishment (early adulthood, ages 25-44), maintenance (middle adulthood, ages 45-65), and disengagement/decline (late adulthood, ages 65 and older) (Super, 1994).

Face validity of these stages seems intuitive because it seems easy to see the manifestation of these stages in the lives of those around us as well as our own. Because Super's theory is perhaps the most highly respected career developmental theory, the current study will utilize Super's stages to offer career development professionals the broadest possible perspective about relationships between the MBTI and SII so that they can optimally help their clients of any age make sense of results of these tests.

Purpose

The purpose of the present study, therefore, is to report age and gender differences in scores on both the MBTI and the SII. To achieve this goal, I seek to describe correlations between scores on newer versions of the MBTI and the SII than in previous studies involving clients of a gender-diverse sample, and of a wider age range than in previous studies from a university counseling center.

Method

The participants involved in this study were taken from 1,242 clients who requested and engaged in career test administration of both the MBTI and SII instruments at the counseling center of a western, research university within a three year period (10/30/2001 through 10/08/2004). The clients may have been students, private

clients, or alumni at the time of the test administration. This number of clients was chosen because it exceeds the minimum $N \geq 50 + 8m$ (m being the number of independent variables) necessary for each of the independent variables, in this case the four dichotomies of the MBTI, to use the statistical technique which the researcher utilized (Tabachnick & Fidell, 1996). Archival data including the client's age, gender, scores on both tests, and date of instrument administration was provided by the publisher of the tests with permission of the university counseling center at the university campus involved in this study.

In an effort to examine correlations between aspects of these two tests in an age diverse sample, it was hoped that many of the clients would provide both their age information at the time of their test administration. Eight hundred twenty one participants who took the SII and one thousand two hundred twenty one who took the MBTI provided age information and were therefore involved in this study. We endeavored to adhere as much as possible to Super's age categories, but because of numbers of participants in each group, the following age groupings were assigned, 167 (SII) and 225 (MBTI) were ages 4-19 (corresponding with Super's exploration/young adolescence stage, ages 4-13), 307 (SII) and 476 (MBTI) were ages 20-24 (corresponding with Super's adolescence stage, ages 14-24), 268 (SII) and 406 (MBTI) were ages 25-44 (corresponding with Super's establishment/early adulthood stage, ages 25-44), and 79 (SII) and 114 (MBTI) were ages 45-74 corresponding both with Super's maintenance (middle adulthood, ages 45-65), and disengagement/decline (late adulthood, ages 65 and older) stages (Super, 1994). We needed to adjust the exploration and disengagement/decline stages as we had approximately 10 participants for each of

these stages if we adhered exactly to Super's recommended age groups. 68% of the participants were female and 32% were male.

Instruments

MBTI Myers et al. (1998). The MBTI has been used widely in the last half of the twentieth century in various educational, business, and mental health settings. The MBTI is based on the theory of human personality developed by Carl Jung (Myers, 1980). Jung described human personality as being comprised of dichotomous preferences relative to human perception and judgment. Each of the items of the MBTI deals with one of four dichotomies. The questions force the respondent of the assessment to choose one of two responses to each item, from which a preference for one pole or the other of each dichotomy is indicated. The four scales are the following: Extroversion-Introversion (EI), Sensing-Intuition (SN), Thinking-Feeling (TF), and Judging-Perceiving (JP). The EI scale deals with whether people prefer to focus their attention on the external world of people and things (E), or the inner world of ideas and impressions (I). The SN scale addresses whether people prefer to deal with present and concrete information gained from their senses (S), or on patterns and possibilities (N). The TF scale encompasses whether people prefer to make decisions based on logic and objective analyses (T), or values and people-centered concerns (F). The JP scale measures how people deal with the outer world. Those with a preference for judging (J) prefer a planned, organized approach to life, and those with a perceiving preference (P) tend to prefer a flexible and spontaneous approach to life.

Each of the MBTI items seek to distinguish an examinee's preference on one of the four scales. A four-letter personality type code is generated from the results of an

MBTI test administration by listing side by side each of the poles for which the examinee showed a greater preference. For example, if an MBTI examinee's results showed that s/he preferred Extroversion (E) over Introversion (I), Sensing (S) over Intuition (N), Thinking (T) over Feeling (F) and Judging (J) over Perception (P), the resultant four-letter personality type code would be ESTJ.

In addition to describing an examinee's preferences on four bipolar scales, a four-letter type code also relates to an ordered sequence of eight mental processes, also known as functions (Myers, 1998). These mental processes refer to the two inner letters of the four-letter type code: S, or N, and T, or F. Each of these four inner letters is discernable by Introversion and Extroversion. The aforementioned test taker with the four-letter type code ESTJ, however, would have the following order of preferred mental processes: Extroverted Thinking (Te), Introverted Sensing (Si), Extroverted Intuition (Ne), Introverted Feeling (Fi), Introverted Thinking (Ti), Extroverted Sensing (Se), Introverted Intuition (Ni), and Extroverted Feeling (Fe).

Jung and Myers assumed that people increasingly develop their less preferred processes as they grow older, but that certain processes are always preferred throughout one's life (Myers, 1980). For example, although the ESTJ previously mentioned will always prefer dealing with their most preferred processes of Extroverted Thinking (Te) and Introverted Sensing (Si), as the ESTJ grows older, they will develop facility in the use of their non-preferred processes such as Extraverted Sensing (Se) and Introverted Intuition (Ni).

Since the late 1980's, four forms of the MBTI have been available for use: Forms F, G, J, and K. In 1998, Form M, which includes 93 questions in forced-choice format,

was made available. The instrument was designed for use with sixth graders through adults. Form M of the MBTI is available in two paper versions including a self-scorable version and a template-scoring version. Form M is also available in an electronically administered, computer-scored version, which uses item response theory to generate more reliable theta scores. The test takers involved in this study used the electronic version of MBTI Form M.

Test-retest reliabilities on the MBTI Form M range from .48 (14 months) to .87 (7 weeks) (Myers *et al*., 1998). Split-half reliabilities range from .67 to .90. Construct Validity is supported by MBTI correlation to other instruments, for example, the MBTI has a .67 - .79 correlation to the Grey-Wheelwright Jungian Type Survey (Myers *et al*., 1998). Internal consistency reliabilities on the MBTI Form M range from .89 to .94 for examinees between the ages of 18 and 70, and between .87 and .95 for college students (Myers *et al*., 1998). Myers & McCaulley (1989) found individuals below age 20 had less reliable scores than older individuals.

As noted in Capraro and Capraro (2002), Harvey (1996) conducted a metanalysis of studies summarized by Myers and McCaulley (1985). Harvey noted that the lowest reliability can be found on the T/F dichotomy, but that across multiple studies, split-half reliability estimates range between .82 and .87 among the four MBTI dichotomies. For this study, no reliability estimates were made because the dichotomous nature of each scale forces the publisher to convert the scores to continuous scores using IRT. Converted scores for each item were not provided by the publisher of this test. Reliability/validity variances between the paper and electronic versions of the MBTI have not been noted, but Myers *et al.* (1998) suggests that the electronic version yields

greater reliability estimates than the paper/pencil version as Item Response Theory is used to score the electronic version.

SII (*Harmon* et al., *1994*). The SII is based on John Holland's theoretical framework, which states that people can be categorized into six personality types, and that people naturally seek occupations allowing them to rely predominately on the attributes of their type (Dillon & Weissman, 1987). The six personality types are Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E) and Conventional (C) (Harmon *et al*. 1994). The instrument uses 325 items to measure interests in four areas that include interest in work, leisure activities, kinds of people, and work settings. The assessment results are divided into five sections that include General Occupational Themes (GOT), which correspond to Holland's six personality types, Basic Interest Scales (BIS), Occupational Scales (OS), Personal Style Scales (PSS) and Administrative Indexes. Since only the SII GOTs are involved in this study, only they are further explained here.

The SII results report each of the GOTs on a five-point Likert scale to determine the degree to which the test taker has an interest in a particular GOT. The scale includes the following five-points: Very Low (VL), Low (L), Average (A), High (H), or Very High (VH). A RIASEC code is developed based on the two to three codes that have the highest scores. The six GOTs are Realistic (R), which indicates an interest in building or repairing, Investigative (I), which indicates an interest in researching or analyzing, Artistic (A), which indicates an interest in creating or enjoying art, Social (S), which indicates an interest in helping or instructing people, Enterprising (E), which indicates an

interest in selling or managing, and Conventional (C), which indicates an interest in accounting, or processing data.

The SII (1994) has a test-retest correlation range of .91 for 3 weeks to .81 over 3 years. Construct validity was .76 when correlating the Vocational Preference Inventory with the SII themes. Numerous other validity studies about the instrument have been conducted with a variety of populations, including college students. The SII items for this population, had high internal consistency, $\alpha = .96$.

Data Analysis Procedures

Two MANOVA analyses were conducted to determine the degree to which age and gender (dependent variables) are predictive of the independent variables MBTI dichotomies, revealed in table 2, and SII GOTs, revealed in table 3. As there were enough participants to coincide with each grouping, the age groupings adhered to Super's five career development age ranges.

Scores generated by the form of the electronic version of the MBTI used by this research sample yield continuous scores that are values of θ resulting from item response theory. The conversion of the MBTI scores to continuous scores was performed by the publisher of the MBTI. Test reliability of the MBTI was tested using Classical Test Theory until the development of the MBTI Form M, in which Item Response Theory has been utilized (Myers *et al*. 1998). IRT has yielded significant increases in score reliability, as noted in the MBTI Manual (Myers et al. 1998).

Results

Two one-way MANOVA's were conducted: one to measure if their were significant differences by age and gender on SII GOTs and the other to measure the

same differences on the MBTI dichotomies. Age differences were found on the SII GOTs (Wilk's λ (18, 2285.854) = 4.985, $p < .001$). Follow-up univariate ANOVAs indicated that Realistic ($F(3, 813) = 2.745$, $p < .05$), Artistic ($F(3, 813) = 13.144$, $p < .001$), and Enterprising ($F(3, 813) = 8.120$, $p < .001$) were among those that generated statistically significant differences. Age differences were also found on the MBTI dichotomies (Wilk's λ (12, 3201.651) = .975, $p < .01$) as well. Univariate tests revealed that Sensing/Intuition ($F(3,1213) = 7.884$, $p < .001$) was the only one of the MBTI dichotomies that generated a statistically significant difference by age. No other statistically significant age differences were discovered among the MBTI dichotomies or SII GOTs. Age differences for all of the MBTI dichotomies and SII GOTs are noted on tables 2 and 3 respectively.

Gender differences were found on the SII GOTs (Wilk's λ (6, 808) = .908, $p < .001$). Among the six SII GOTs, follow-up univariate analyses revealed statistically significantly gender differences only on SII Realistic ($F(1, 813) = 39.327$, $p < .001$), Investigative ($F(1, 813) = 9.245$, $p < .01$), Artistic ($F(1, 813) = 5.692$, $p < .05$), and Social ($F(1, 813) = 6.123$, $p < .05$). Gender differences were also found on the MBTI dichotomies (Wilk's λ (4, 1210) = .958, $p < .001$). Among the MBTI dichotomies Sensing/Intuition ($F(1, 1213) = 5.054$, $p < .05$), Thinking/Feeling ($F(1, 1213) = 20.996$, $p < .001$), Judging/Perceiving ($F(1, 1213) = 18.013$, $p < .001$) were among those with statistically significant differences by gender. Details of gender differences on the MBTI dichotomies and SII GOTs are noted in table 4.

Discussion

Scores on one of the MBTI dichotomies and two of the SII GOTs were significantly different by age. As one ages, they are more likely to choose MBTI Intuition over MBTI Sensing. Relative to the SII GOTs, individuals increasingly choose SII Artistic with age. Ages 25 - 44 seem to be a critical period as individuals tend to decreasingly choose SII Enterprising through about age 44, after which time they choose it slightly more and increase in their interest in Realistic careers through age 44, after which time Realistic scores slightly decrease.

Gender differences were also noted. Women are more likely to choose MBTI Sensing, Feeling and Judging as opposed to men who are more likely to choose MBTI Intuition, Thinking and Perceiving. On the SII, men are more likely than women to choose the SII GOTs Realistic and Investigative whereas women are more likely than men to choose Artistic and Social.

MBTI Age Differences

The findings of this study show that as the groups increased in age, they more often scored MBTI Intuition over MBTI Sensing. Also, the most dramatic increases in the choice of MBTI Intuition were in the first three age groups, up through age 44. After that, the increase in number of individuals that chose MBTI Intuition was small.

As described above, Jung (1923) originally described individual's with a preference for Intuition as preferring to perceive the world by means of ideas, concepts, impressions and abstractions and preferring not to have to rely on their less preferred Sensing function, which forces them to use concrete, factual information gained from their senses to understand the world. The implication is that as individual's age, they

increasingly prefer to experience the world from a less, factual, and concrete frame of mind instead choosing an increasingly abstract, ideas-oriented perspective.

Surprisingly, this finding is in complete contrast to an essential aspect of Jung's (1923) originally posited theory of psychological types whereby type preferences are innate, that individuals are born with them, and that all of the psychological type preferences simply increasingly develop as one ages. The finding of this study that individuals increasingly choose Intuition as opposed to Sensing implies that psychological type preferences, or at least this particular one, are not static and can change with age.

It seems instinctive to think that individuals increasingly prefer to see things in more abstract ways. As individuals gain more understanding of, and adaptation to the world around them, they might strive for increased challenges that they perceive to be increasingly abstract in nature. Although it does not seem difficult to believe that individuals increasingly prefer challenges including abstract experience which they have not experienced, it is interesting that this finding is inconsistent with Carl Jung's original theory and that no other age differences were found among the other MBTI dichotomies.

SII Age Differences

The conclusion that individuals increasingly prefer to perceive the world in abstract, less concrete ways coincides with the finding that individuals prefer SII Artistic increasingly as they age. Where individuals seem to increasingly prefer MBTI Intuition as they age especially through about age 44, the findings about SII Artistic indicate a smaller increase in interest for SII Artistic in the 25-44 age range. Rather, individuals

seem to increasingly prefer Artistic career interests through their early twenties, slightly more through age 44, and significantly more after age 45.

Where the desire for creative endeavor seems to increase throughout life, this study shows the number of SII Enterprising scores decreased while Realistic scores increased through age 44, but then shifted inversely thereafter. Taken together with the finding that individuals largely increasingly prefer to perceive the world in abstract, less concrete ways (MBTI Intuition) in ever more creative settings (SII Artistic) as they age, it seems curious that they would become less interested in pursuing entrepreneurial pursuits and more interested in hands-on pursuits through age 44, then increasingly shed their Realistic interests and prefer entrepreneurial ones after age 44. From these findings one might conclude that as individuals age they desire increased creativity in their work lives, but do not want to be quite as hands-on after midlife. Because of the facility and confidence they develop throughout their career through midlife; however, they feel more emboldened thereafter to make bold entrepreneurial career decisions.

Findings from a recent study by Gursoy, Maier, and Chi (in press) helps to illuminate understanding of age differences in career interests by explaining generational differences in workplace values. As the researcher described above, baby boomers, who are at or close to retirement age, have been found to prefer a structured, hierarchical approach to organizational management (Gursoy, Maier, and Chi, in press), which does not sound like an environment that fosters creativity and entrepreneurialism among its workers. One might expect the preference for creativity and ambiguity might decrease with age based on Gursoy, Maier, and Chi's description of younger workers who tend prefer collective management, instant gratification, and a less confining work

environment. Future research would certainly enlighten these findings by exploring work place values individually across multiple age groups, in different cultures, perhaps utilizing qualitative methodology to discover differences in workplace values in more detail.

These findings also do not relate very well to the theory of Donald Super. As the researcher described earlier, Super (1957, 1980, 1984) asserts that individuals increasingly develop their careers as they grow older, but his theory does not address the degree to which workers desire or value opportunities for individual creativity in their work, much less changes in a construct such as creativity as one ages. Future research needs to further explore how the increasing value of workplace creativity found in this study might relate to Super's theory or might expand our understanding of career development throughout the lifespan by enhancing his theory.

Gender Differences

The findings of this study suggest that men prefer careers that allow them to engage in hands-on, practical, traditional careers (SII Realistic) that allow them to be inquisitive (SII Investigative) and creative (MBTI Intuition) as well as to make practical, logical decisions (MBTI Thinking) in a flexible, spontaneous, open-ended environment (MBTI Perceiving). In contrast, this study also suggests that women prefer career fields that allow them to understand work-related situations in a factual, concrete, sensory manner (MBTI Sensing) in a setting where developing and maintaining social relationships (MBTI Feeling, SII Social) in a creative way (SII Artistic) is valued, and that is a structured, organized environment (MBTI Judging). As noted in many other previous studies (Fouad, 2002; Fouad, Harmon & Borgen, 1997; Hansen, Collins,

Swanson, & Fouad, 1993; Hansen, Scullard & Haviland, 2000; Hines, 1983; Swanson, 1992; Lapan, Boggs, & Morrill, 1989; Montoya & DeBlassie, 1985; Tak, 2004) males connote higher interests in Realistic, and Investigative careers than females and women score higher than men on Social and Artistic. The results of this study support these previous findings.

One question that these findings might generate involves why men and women have these preferences? Are men socialized in our society to prefer hands-on, jobs that allow them to make logical decisions? Do men and women really have these preferences or are they answering questions on the MBTI and SII in ways that they think will reflect these types of scores, which they feel are socially or personally acceptable to themselves? Men and women with the set of preferences described in these scores seems very much to be aligned with many gender-role stereotypes of what men and women should do or be as evidenced by the literature on gender specific career-related learning situations (Williams & Subich, 2006; Betz, Harmon, & Borgen, 1996), outcome expectations for traditionally gender specific careers (Lent, Brown, & Hackett, 1994), and traditionally gender specific career self-efficacy (Betz & Hackett, 1981). Future research would inform us about these findings by searching for reasons why men and women develop and/or report these particular career preferences/interests.

Practical Applications

Gender Applications

Career counselors would certainly be informed by knowledge that more than any other set of preferences, many men prefer practical, hands-on careers that allow them to approach career-related problems from a logical, rational perspective. New counselors

would do well to learn this knowledge in advance of their initial experiences counseling individuals with these tests and more experienced counselors would also inform their practice with this knowledge. Counselors might encourage clients to explore careers described on test application materials that are preferred by others with similar test scores that the client has never before explored. This would expand the number of career fields in which the client understands that they can use their preferences. Counselors might also encourage their clients to look beyond the career fields that they might typically consider to be gender appropriate that they might enjoy, but have never before considered because of their perceptions of gender-role stereotypes.

Both men and women in the workplace need to be aware of these career interest tendencies as well. If men, for example, are more likely than any other preference to prefer logical, rational sorts of career activities, supervisors of either gender should strive to allow men to use these preferences in the workplace without unfairly pushing male employees to assume job responsibilities that might take them out of this comfort zone. The same is true for women. Likewise, if women prefer careers that allow them some creativity, in a structured setting where they are valued from their interests in maintaining harmony among employees, it is important for supervisors to allow women opportunities to utilize these preferences. Managers in all workplace settings can use this information in their planning and structuring of job tasks and overall workplace organization. If they do, employees might more likely develop confidence in their job capabilities. This in turn might increase employee retention within organizations as employees will feel more loyal to an employer that provides them with opportunities to use their unique gifts.

Also, important to consider is the fact that although this study suggests that we can predict the career interests of many men and women, not all men and women will generate these same career preferences when taking these tests. Although findings from this study show that women, for example prefer MBTI Sensing, Feeling, and Judging, and SII Artistic and Social more than men, there will still be men who score any of these preferences that are more typical of women. While not all men will have these same preferences, it is important for employers to know that most men will prefer so that they will know how to deal with the great majority of the men with whom they work. It is likewise important for counselors to know what most men will prefer in preparation for their career counseling interpretation sessions as other clients who might generate other scores might wish they had also scored these seemingly gender appropriate career test scores.

Age Applications

As described above, individuals tend to increasingly prefer careers that allow them creativity (MBTI Intuition, SII Artistic) throughout life. They also increasingly prefer hands-on, less entrepreneurial careers through approximately age 44. Although their preference for creativity continues to increase after age 44, individuals also shift in that they prefer less hands-on, more entrepreneurial careers in this stage of life.

Certainly this is important for counselors to know. Counselors need to know what clients of particular ages are most likely to prefer. Based on this knowledge, a counselor can inform their client about the degree to which the client's results are like those of others who are the client's age. If they are not, it might help the client to understand why they do not perceive their career choice to particular as common for

their age. Certainly doing things differently from others who are like yourself is always a challenge, but having knowledge about what is likely to be a challenge for someone who chooses a career that is different from others who are their age is certainly informative for a client to know.

In addition to counseling, these findings also have applications in the workplace more broadly. It is important for supervisors to know age differences in career interests/preferences because it could help supervisors understand why particular communication problems occur in the workplace. For example, if an employee who is in the early 20's scores quite high on MBTI Intuition and SII Artistic, this employee might be more likely to report to their counselor that they have had difficulty explaining their complex, abstract ideas to other individuals who are their age. This may be because people are less likely to develop facility in using MBTI Intuition and SII Artistic until later in life. The client might also develop an understanding of why their ideas may not seem very practical to others who are close to their age. A counselor can report to their client, based on findings from this study, that they may have an easier time explaining their complex ideas to those who are older and that the client's ideas may become more workable with time as those with whom they communicate/work are more likely to be older.

As supervisors are constantly striving to understanding complex communications issues in making employee placement and hiring decisions, an understanding of their employees interests/preferences and the degree to which they are typical of others of that age may inform supervisors of why communication problems are occurring or have occurred in the past. This may assist the manager in making decisions that help both the

employee in question and the organization as a whole in their efforts to develop and retain employees.

Limitations

Despite the insight that these findings provide to career counselors, there are several limitations that future researchers might wish to account for in future research. First, while the number of participants involved in this study was considerably larger than those of previous studies in this area, these participants were students or clients of a highly prestigious research university. Career practitioners working with, for examples, clients in religious institutions, corporate executives, especially outside the United States, or even college students that are not related to prestigious research universities may not feel they can completely generalize the results of this study in their understanding and decision making about their clients' test scores. Future research, therefore, might study similar relationships with different populations in religious settings, or other higher education and business settings toward building a theory about scores between these two tests.

Age, gender, and ethnicity are also significant to note. While this study involved a larger age range than in previous studies in this area, larger concentrations of the participants were in their 20's than in any other age range and the numbers of participants lessened as age increased. Future studies would provide more insight in this area if they involved larger numbers of participants that were in their 30's and older. While the gender of the participants in this study were noted, this study involved 2/3 females like previous work in this area. Future studies would expand our knowledge in this area if they explored these relationships among a group of participants that included

more males. Finally, ethnicity was not noted in this study and was also not noted in previous studies. Possible ethnic differences in these test scores could certainly expand our knowledge of personality and career interests differences across various cultures.

Other weaknesses relate to reliability and acquisition of the test score data. While both the MBTI and the SII are considered to be reliable, as noted above, the fact that no reliability differences in the paper version vs. the online version of either of these tests are available, is a limitation. The publisher of these tests would not reveal the exact method by which the MBTI test scores were converted from dichotomous scores into continuous ratio data. Although obtaining the data from the publisher in this way is common practice for researchers conducting similar research (Myers et al, 1998), knowing the exact procedure would offer replicability of a study such as this more so into the hands of researchers and would thus give the results greater credibility. Also related to obtaining the test score data for research, the researcher was unable to analyze Cronbach's Alpha reliability coefficients for these two tests because the scoring information about these two tests was not made available by the test publisher. Future researchers might wish to try to overcome this weakness in this study.

CHAPTER V

JOINT INTERPRETATION OF THE *MYERS-BRIGGS TYPE INDICATOR* AND THE *STRONG INTEREST INVENTORY*

Introduction

Career tests are popular tools used to help individuals decide what career to pursue (Brown & Associates, 2002; Osipow & Fitzgerald, 1996). Despite an extensive extant literature about administering and applying results from individual career tests to clients (Walsh & Osipow, 2005), two of the most commonly utilized career tests, the *Myers-Briggs Type Indicator* (MBTI®) (Myers, McCaulley, Quenk & Hammer, 1998) and the *Strong Interest Inventory* (SII™) (Harmon, Hansen, Borgen, & Hammer, 1994), are commonly jointly administered (Hammer & Kummerow, 2001; Kummerow, 2000).

Because of this, many counselors may tend to expect certain results on one test based on the results of the other. For example, if an individual scores high on MBTI Intuition, which relates to a preference for perceiving new ideas from an abstract, conceptual perspective (Myers, 1998), their counselor might expect this client to also score high on SII Artistic, which relates to an interest in creative endeavor (Harmon, *et al*., 1994). Other test score patterns across these tests also commonly simultaneously occur such as MBTI Thinking, which relates to a logical, rational approach to problem solving and SII Realistic, which relates to hands-on, practical approach interests or MBTI Feeling, which relates to making decisions first and foremost based on person-centered concerns and SII Social, which relates to interests in understanding and working with people.

Because these score patterns occur often, and many have also been empirically supported (Apostal, 1991; Dillon & Weissman, 1987; Hammer & Kummerow, 2001; Myers *et al*., 1998) it is not always necessarily very difficult for a counselor to determine what advice to offer their client when any of these patterns occur in their client's tests scores. Often when, as in the first example, a client scores high on MBTI Intuition and SII Artistic, the counselor may not have too much challenge in interpreting and helping the client make sense of these results as these two constructs from these two different tests seem very similar. Also, the application materials of these tests describe similar preferred activities and career interests for an individual with a preference for MBTI Intuition and an interest in SII Artistic.

As a former career counselor myself having used both of these instruments with clients conjointly, it seems that the problem comes when the test scores of both tests do not seem to match. For example, how does a counselor make sense of a client's test scores when, for example, the client scores high on MBTI Intuition and high on MBTI Realistic, which is related to a hands-on, concrete approach to understanding and dealing with new stimuli (Harmon, *et al*., 1994). While these simultaneous test scores are not necessarily that uncommon, tests score patterns across both tests that do not occur very often offer counselors complex interpretive challenges in their efforts to help clients understand and apply to a career decision making plan.

Because people make such important decisions based on what they learn from these tests, it follows that much needs to be known about the meaning of these results and how they relate to the lives of the people who utilize them (Swanson & Fouad, 1999). Our purpose here is to describe two vignettes each about a hypothetical career

testee to illuminate approaches to reviewing test scores of both of these tests even when the scores on one test are not necessarily typical based on the scores of the other. The researcher will describe career issues related to each client, their results on both the MBTI and the SII, the interpretive problem inherent in using these tests jointly, and how counselors can navigate interpretation and explanation of results of both tests in ways that optimally assist their client in career decision making. We begin; however, by briefly describing the tests in question: the MBTI and the SII.

Myers-Briggs Type Indicator (MBTI)

Katherine Myers originally began developing the *Myers-Briggs Type Indicator* (MBTI) (Myers, McCaulley, Quenk & Hammer, 1998) in the early 20th century in response to having discovered C. G. Jung's theory of psychological types (Jung, 1923), which she felt accurately described the distinctions between individual's personality preferences (Saunders, 1991). Because she thought psychological type would help women, many of whom were embarking for the first time on careers when male workers were becoming scarce during World War II, she deemed it necessary to create a personality indicator that could help women understand their individual strengths and weaknesses the results of which could help them in their career decision making.

The MBTI is based on C. G. Jung's theory of human personalities, each of which he believed were comprised of one preference on four dichotomies: Extroversion-Introversion (EI), Sensing-Intuition (SN), Thinking-Feeling (TF), and Judging-Perceiving (JP) (Jung, 1923). The EI scale deals with whether people prefer to focus their attention on the external world of people and things (E), or the inner world of ideas and impressions (I). The SN scale addresses whether people prefer to deal with present

and concrete information gained from their senses (S), or on patterns and possibilities (N). The TF scale encompasses whether people prefer to make decisions based on logic and objective analyses (T), or values and people-centered concerns (F). The JP scale measures how people deal with the outer world. Those with a preference for judging (J) prefer a planned, organized approach to life, and those with a perceiving preference (P) tend to prefer a flexible and spontaneous approach to life. Since the MBTI's initial development, it has been validated by hundreds of research studies and has been used widely throughout the world in the fields of education, counseling (Myers, McCaulley, Quenk & Hammer, 1998), and the world of work (Kummerow, 2000: Tieger & Barron-Tieger, 2001).

***Strong Interest Inventory* (SII)**

The *Strong Interest Inventory* (SII) (Harmon, *et al*., 1994) has been widely used for career development activities since the mid 20th century (Levin, 1990; Pinkney, 1983). The SII is based on John Holland's (1997) theory of six career-related personality types (RIASEC) including Realistic (R), which indicates an interest in building or repairing, Investigative (I), which indicates an interest in researching or analyzing, Artistic (A), which indicates an interest in creating or enjoying art, Social (S), which indicates an interest in helping or instructing people, Enterprising (E), which indicates an interest in selling or managing, and Conventional (C), which indicates an interest in accounting, or processing data.

Holland (1997) asserted that environmental and biological influences lead us to develop our personality that is defined by the degree to which we develop these career interests. Our personality, therefore, can be represented by a hierarchy of these six

career interests. For example, one individual might report interests that are represented as ASEIRC with Artistic (A) as their highest interest and Conventional (C) as their least interest, while another individual may report a completely differently ordered hierarchy.

In addition to these representations, Holland asserts that a central life goal is to match ideal career environments in which we work, with this career interest hierarchy. For example, the person mentioned above would naturally strive to seek work that allows primary use of their Artistic (A) interest and least of all, their Conventional (C) interest.

Thus, a universal life goal of all individuals is to find and sustain work in a career environment that aligns personality preferences with model environment. For example, if an individual who exhibits characteristics that are indicative of the Social personality type would strive toward securing a job that allows engagement in activities relative to the Social model environment, they would be likely to achieve career satisfaction.

Case Examples: Linda and William

The cases below describe clients that might seek career counseling and the interpretive challenges that career counselors face in working with them. Both clients are fictional. I chose to describe individuals with these particular characteristics because, in my past experience as a university career counselor, clients with these attributes and test scores exemplify some of the most perplexing results counselors regularly strive to assist their clients in understanding. As will be shown, the clients are not only different from one another by gender, age, ethnicity, professional background and scores on the MBTI and SII, but are different in all of these ways from the participants studied in previous research that has examined correlations between client

scores on these two tests (Apostal, 1991; Dillon & Weissman, 1987; Hammer & Kummerow, 2001; Myers *et al*., 1998). Because of these differences, the purpose of explaining these cases is to illuminate approaches that a career counselor can take in understanding career test results that do not necessarily align with their expectations across both tests.

Case Example: Linda

Background

Linda is a 40-year-old Asian-American woman with a bachelor's degree in accounting. As a single mother of three, Linda feels burdened to continue working in her current job, which she feels offers her a steady income to support her children. Linda completed her bachelor's degree eight years ago in the evenings when she and her husband were having children. She pursued accounting because she felt that it was a career field that would enable her to easily find steady employment in most locations as her husband's career required many transfers to different states. Linda has felt confident in this career decision in the past eight years as her family has lived in three different states due to her husband's job transfers with the same company, and Linda has been able to secure an accounting position in each of these cities.

Linda was very happy about her career choice in that she can see how the practicality of choosing what she feels to be a high-demand profession for which she feels every organization needs workers, has enabled her to provide steady income for her family. Despite the practicality of her career choice, Linda has felt less satisfaction with her job since her recent divorce. As a child Linda enjoyed writing. In school her teachers began telling her at an early age that she was particularly gifted both in her

sentence and paragraph structure and in the creative ways that she expressed complex ideas. As Linda grew older she continued to receive similar accolades as she won awards for her writing throughout her K-12 educational experiences, and earned high grades on writing assignments in college.

Career Test Results

The results of Linda's MBTI and the SII are summarized in table 1.

MBTI. Linda's MBTI results indicated the ESFJ personality type code. According to the MBTI (Myers, McCaulley, Quenk & Hammer, 1998), Extraversion (E) indicates a preference for a focus on the outer world of people and things; Sensing (S), a preference for focusing on concrete information gained from their senses; Feeling (F); a preference for basing decisions primarily on subjective people-centered concerns, and Judging (J); a preference for a planned, organized, settled approach to life.

SII. Linda's SII results included the following three letter type code: Artistic (A), Enterprising (E), Conventional (C). According to the SII (Harmon, *et al*., 1994), A indicates an interest in creating or enjoying art; E in selling and managing, and C in accounting or processing data (Holland, 1997).

Analysis of Test Results

Previous research that has examined relationships between the MBTI and the SII indicates that Linda's results are not typical (Dillon & Weissman, 1987; Apostal, 1991; Myers *et al*., 1998; Hammer & Kummerow, 2001). Because ESFJ according to the MBTI indicates a preference for many social experiences and interactions with people, which typically corresponds with MBTI, Extraversion, Sensing, and Feeling, a counselor might find Linda's high SII Enterprising score, which indicates a preference for selling,

and managing to be easy to explain to Linda. Likewise, MBTI ESFJ would likely also not be difficult to explain to Linda as the Judging (J) aspect of the ESFJ personality relates to a planned, settled, organized approach to the outer world, which could be easy to relate to SII Conventional, which indicates an interest in maintained, regular, consistent sorts of activities such as accounting and processing data.

The conundrum for the counselor comes in explaining how Linda's MBTI ESFJ score relates to Linda's highest SII interest, which was Artistic (A). Those with MBTI ESFJ preferences typically prefer more than others to have many social interactions with people (MBTI, Feeling), but prefer to do so in a very concrete (MBTI, Sensing) and orderly manner (MBTI, Judging) (Myers, et al., 1998; Myers & Myers, 1980). Typically those who score high on SII Artistic, according to previous research, score high on MBTI Intuition (N), which indicates a preference for viewing the world in terms of patterns and possibilities rather than concrete sensory means as related to MBTI Sensing (S)(Dillon & Weissman, 1987; Apostal, 1991; Myers *et al*., 1998; Hammer & Kummerow, 2001). In sum, while certain aspects of Linda's MBTI personality type code ESFJ seem to be easily understandable relative to Linda's SII type code AEC, specifically MBTI Extraversion, Sensing, and Judging with SII Enterprising, and Conventional, Linda's highest interest score on the SII is Artistic, which does not seem to relate as easily to MBTI ESFJ as SII Enterprising, and Conventional.

One possible explanation for Linda's test results is simply test error. Many texts that describe applications of the MBTI, for example, advocate using MBTI test scores as a hypothesis of the client's actual personality preferences and that developing an understanding of Jung's theory, upon which the MBTI is based, can most accurately help

clients clarify their personality preferences (e.g. Hartzler, 2000). Linda's personality preferences might better be explained by MBTI ENFJ than ESFJ, which would connote a high preference for patterns and possibilities (MBTI Intuition) rather than concrete data gained from the senses (MBTI Sensing). This score would be more in line with results of previous studies that align MBTI Intuition with SII Artistic.

Interpretation of Test Results

Because the relationship between Linda's results on the MBTI and the SII are so different from what previous research in this area describes as being typical, and are so different from the counselor's expectations, the counselor is faced with the problem of trying to interpret these results in ways that most advantageously make applicable sense to the client. There are many possible ways to interpret Linda's test results. Although the results of the tests tell us much about Linda, it is important to consider as much as possible that the client wishes to share with the counselor to most fully understand the context of the test results.

From the knowledge that we learned about Linda, described above, Linda may have a highly developed interest in creating and enjoying artistic endeavors as revealed both in the SII and the fact that she excelled and received accolades early in life in writing. She might also have a high sense of family responsibility as reflected both in the Feeling aspect of her MBTI ESFJ score and the fact that she noted her emphasis in initially choosing a career field that would likely consistently help her family financially. Many who exhibit ESFJ personality preferences tend to place a high value on caring for the needs of others (Myers, *et al*., 1998; Myers & Myers, 1980. Now that Linda is recently divorced; however, she may feel trapped in her initial career choice as she

reflects on her past life decisions and is now interested in looking inward more to serve her own needs despite the responsibility she feels to meet the needs of her children.

All of these are very plausible ways that Linda's counselor could make sense of Linda's test results and this analysis might very much help Linda to understand how her past and current life decisions relate to her personality preferences and work interests.

Case Examples: William

Background

William's situation offers different, but likewise perplexing interpretive problems to a counselor who might be working with him. William is a 55 year-old, African-American male who, as a recently retired engineer, is looking for a new direction for his life. In his formative years, William was strongly encouraged to follow his interests in deciding upon a career and he has felt very satisfied in his engineering work throughout his life. Now that his children are independent young adults and his home is mostly paid for, his friends have suggested that he pursue whatever interests he has delayed pursuing throughout his life and simply not worry about pursuing a career. William; however, has decided that he wants to continue working and pursue a second career not in engineering.

Career Test Results

William's MBTI and SII results are summarized in table 2.

MBTI. William's MBTI results indicated the INTP personality type code. According to the MBTI (Myers, McCaulley, Quenk & Hammer, 1998), Introversion (I) indicates a preference for focus on the inner world of ideas and impressions; Intuition (N), a preference for focusing on the future, with a view toward patterns and

possibilities; Thinking (T); a preference for basing decisions primarily on logic and on objective analysis of cause and effect, and Perceiving (P); a preference for a flexible and spontaneous approach to life, keeping their options open.

SII. William's SII results included the following three letter type code: Social (S), Artistic (A), Enterprising (E). According to the SII (Harmon, *et al*., 1994), S indicates an interest in helping and instructing; A indicates an interest in creating or enjoying art, and E indicates an interest in selling and managing (Holland, 1997).

Analysis of Test Results

William's test results would likely be difficult for a career counselor to understand because his MBTI results are consistent with the research literature, but his SII results are not. MBTI application materials state that an MBTI result of INTP is typical among engineers (Myers, *et al*., 1998; Tieger & Barron-Tieger, 2001), and the idea of one who prefers the inner world of ideas and impressions (MBTI Introversion), ideas and impressions (MBTI Intuition), logic and objective analysis (MBTI Thinking), and a flexible and spontaneous approach to life (MBTI Perceiving) seems to fit the lifestyle of an engineer. Based on this MBTI score, a counselor would have little trouble explaining to William why he enjoyed his engineering career.

Again, his SII results are what are perplexing. William's results indicate a preference for helping and instructing (SII Social), creating or enjoying art (SII Artistic), and selling, managing (SII Enterprising). While one would not necessarily say that someone who enjoys engineering cannot enjoy these activities, previous research in this area indicates little relationship between those with this combination of MBTI and SII

results (Dillon & Weissman, 1987; Apostal, 1991; Myers *et al*., 1998; Hammer & Kummerow, 2001).

Application Problems of Test Results

Where Linda's results revealed scores that were typically inconsistent with others of her chosen profession, and made her counselor's role in assisting potentially somewhat streamlined, the problem with William's test scores is that his MBTI score is very consistent with others of his profession, but his SII score is not. While in the case of Linda, both scores are inconsistent relative to her original chosen profession making a counselor's potential prescription to Linda pretty simple – the counselor could simply recommend to Linda that she consider following the results of the tests and consider professions associated with those results.

William's case, however, is different from Linda's in that he has for many years enjoyed a profession that is consistent with one of his test scores, but his other test scores reveal someone whose interests emphasize first and foremost helping and instructing and creating and enjoying art, which is not typical among others of his former profession. In William's case, a counselor could simply suggest that he consider other professions that are similar in many ways to engineering, which would be revealed in the applications materials from his MBTI results, but a counselor might also suggest that he consider very different careers that would be consistent with his SII test results.

Both of these interpretive solutions including suggesting that William explore other professions that are typical of others with his MBTI type and those that may not be as typical of his MBTI type, but that are typical of other with his SII test scores would be likely be beneficial to William.

Conclusion

As the case examples above illuminate, just because many clients who score high on MBTI Intuition, for example, also score high on SII Artistic, this does not always mean that all clients who generate one of these scores will always score the other. Whether a client scores high on two career tests in ways that are similar to other clients, much information about the client needs to be considered besides that which is reported in the career test results. If one test generates one thing, while the other test indicates personality preferences or interests that seem different, it is more likely that between the information from both tests, clients will be able to understand themselves relative to the world of work.

When advising their clients, clearly it is important for a counselor to take into account not only results of career tests, but also information gathered from their clients in counseling sessions. Information generated from the results of both tests, as well as information gathered from counseling the client, can help a counselor assist their client understand themselves in the most comprehensive possible way. This in turn can help the client understand how to fit the information gathered into the career choice that best works for them, which can in turn, help the counselor help the client to make informed career decisions. This will lead to lessened likelihood of occupational mismatch between the client and a possible career choice.

CHAPTER VI

CONCLUSIONS

Overall, the findings suggest interesting differences in career test scores across both tests relative both to age and gender. It seems that many gender-role stereotypes were supported in by this study. For examples, in this study, men generated higher preferences for logical, rational career activities than women and women scored higher interests in career-related activities that allow them to develop and maintain social relationships. As women are typically described as more often being maintainers of social relationships within family structures, these scores do not seem too surprising.

Also, not surprising was the finding that both men and women both increasingly exhibit preferences for career-related activities that force them to think outside-of-the-box and in ways that they never have before as they age. While Jung's theory of psychological types postulates that we either prefer hands-on, concrete activities or abstract, conceptual activities consistently throughout our lives, our findings show an increasing prefer for the latter with age.

Counselors can benefit from this knowledge in that knowledge of what is typical can help frame the way that counselors advise all of their clients about career-related decisions. Employers can also benefit from this knowledge as it might help understand how to better develop employee retention programs.

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APPENDIX

Table 1.

Summary of MBTI Dichotomies and SII GOTs

Myers-Briggs Type Indicator (MBTI)* Dichotomies		Strong Interest Inventory (SII)** GOTs
Extraversion – Tend to focus on the outerworld of people and things	Introversion – Tend to focus on the inner world of ideas and impressions	Realistic – Building, Reparing
Sensing – Tend to focus on the present and on concrete information gained from the senses	Intuition – Tend to focus on the future, with a view toward patterns and possibilities	Investigative – Researching, analyzing
Thinking – Tend to base their decisions primarily on logic and on objective analysis of cause and effect	Feeling – Tend to base their decisions primarily on values and on subjective evaluation of person-centered concerns	Artistic – Creating or enjoying art
Judging – Tend to like a planned and organized approach to life and prefer to have things settled	Perceiving – Tend to like a flexible and spontaneous approach to life and prefer to keep their options open	Social – Helping, instructing
		Enterprising – Selling, managing
		Conventional – Accounting, processing data

Note. *From Myers et al. (1998), **From Harmon et al. (1994).

Table 2.

Correlations and Standardized Canonical Coefficients Between SII GOTs and MBTI Dichotomies and Their Canonical Variates

	First variate		Second variate	
Variable	Correlation	Canonical Coefficient	Correlation	Canonical Coefficient
SII GOT's (Criterion Variable Set)				
Realistic	-.012	.091	.470	.550
Investigative	.138	.214	.417	.487
Artistic	.827	.798	-.234	-.176
Social	-.177	-.110	-.762	-.663
Enterprising	-.194	-.346	.119	-.042
Conventional	-.407	-.552	-.023	.099
MBTI Dichotomies (Predictor Variable Set)				
Extraversion/Introversion	.080	.089	.254	.234
Sensing/Intuition	.937	.990	-.020	-.029
Thinking/Feeling	.027	.249	-.954	-.854
Judging/Perceiving	.119	.489	.480	.261

Table 3.

Age Comparisons for the MBTI Dichotomies

	MANOVA		Ages 4-19 (n=225)		Ages 20-24 (n=476)		Ages 25-44 (n=406)		Ages 45+ (n=114)		ANOVA	
	df	F	M	SD	M	SD	M	SD	M	SD	F	η^2
MBTI Dichotomies	12, 3201	.975**										
Extraversion/Introversion			.0737	.92505	.0374	.91361	.0779	.94218	.1407	.90759	.655	
Sensing/Intuition			-.0286[c]	.78367	.1487[b]	.80675	.2929[a]	.82464	.2998[ab]	.87860	.7884***	.02
Thinking/Feeling			.1081	.74474	.1077	.86198	.0270	.80250	.1598	.81194	.255	
Judging/Perceiving			-.0508	.80544	-.0493	.84202	-.0081	.88192	-.0667	.85067	.143	

Note: Means with the same letter are not significantly different from each other using a Tukey HSD post hoc test

Table 4.

Age Comparisons for the SII GOTs

	MANOVA		Ages 4-19 (n=225)		Ages 20-24 (n=476)		Ages 25-44 (n=406)		Ages 45+ (n=114)		ANOVA	
	Df	F	M	SD	M	SD	M	SD	M	SD	F	η^2
SII GOTs	18, 2285	.897***										
Realistic			43.50[b]	8.968	46.21[a]	9.080	46.30[a]	8.848	44.97[ab]	8.888	2.745*	.01
Investigative			46.20	9.563	47.70	8.979	48.01	9.671	47.18	10.658	.632	
Artistic			48.70[c]	9.691	52.24[b]	9.585	53.53[ab]	9.181	56.28[a]	8.224	13.144***	.04
Social			49.46	9.965	49.99	10.100	48.94	9.201	50.19	9.246	.299	
Enterprising			49.19[a]	10.086	48.64[a]	10.211	45.12[b]	8.463	47.78[ab]	9.450	8.120***	.03
Conventional			47.04	8.962	46.33	8.653	45.75	8.730	47.85	8.923	.978	

Note: Means with the same letter are not significantly different from each other using a Tukey HSD posthoc test

Table 5.

Gender Comparisons for the MBTI Dichotomies and the SII GOTs

	MANOVA		Males[a]		Females[b]		ANOVA	
	df	F	M	SD	M	SD	F	η^2
MBTI Dichotomies	4, 1210	.958***						
Extraversion/Introversion			.1060	.95610	.0487	.90842	1.2755	
Sensing/Intuition			.2734	.84206	.1325	.81034	.054*	.00
Thinking/Feeling			-.1189	.84499	.1837	.78553	20.996***	.02
Judging/Perceiving			.1628	.90526	-.1333	.80386	18.013***	.01
SII GOTs	6, 808	.908***						
Realistic			48.86	9.017	43.99	8.586	39.327***	.03
Investigative			49.14	9.354	46.63	9.475	9.245**	.01
Artistic			50.57	9.686	53.17	9.426	5.692*	.01
Social			48.04	9.537	50.28	9.703	6.123*	.01
Enterprising			46.92	9.695	47.81	9.709	1.144	
Conventional			46.02	7.971	46.63	9.136	.762	

*$p < .05$, **$p < .01$, ***$p < .001$
a. $n = 395$, b. $n = 826$

Table 6.

Summary of Linda's SII and MBTI Test Results

Myers-Briggs Type Indicator (MBTI)*	Strong Interest Inventory (SII)**
Extraversion – Tend to focus on the outer world of people and things	Artistic – Creating or enjoying art
Sensing – Tend to focus on the present and on concrete information gained from the senses	Enterprising – Selling, managing
Feeling – Tend to base their decisions primarily on values and on subjective evaluation of person-centered concerns	Conventional – Accounting, processing data
Judging – Tend to like a planned and organized approach to life and prefer to have things settled	

*From Myers et al. (1998), **From Harmon et al. (1994)

Table 7.

Summary of William's SII and MBTI Test Results

Myers-Briggs Type Indicator (MBTI)*	Strong Interest Inventory (SII)**
Introversion – Tend to focus on the inner world of ideas and impressions	Social – Helping, instructing
Intuition – Tend to focus on the future, with a view toward patterns and possibilities	Artistic – Creating or enjoying art
Thinking – Tend to base their decisions primarily on logic and on objective analysis of cause and effect	Enterprising – Selling, managing
Perceiving – Tend to like a flexible and spontaneous approach to life and prefer to keep their options open	

*From Myers et al. (1998), **From Harmon et al. (1994)

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